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ABSTRACT

The paper examines research on the education of gifted students. Studies are cited and conclusions drawn for 10 topic areas: (1) identification (methods, recommended commercial tests, sex differences, emotional differences); (2) rationale for special provisions; (3) talent loss (dropping out and educational deprivation); (4) needed personnel (teacher competencies); (5) underachievement (potential behavioral indications); (6) cultural diversity (cultural bias of intelligence tests, culturally-supported attitudes and attributes); (7) ability grouping (magnet schools, multi-age classrooms, pullout programs, summer institutes); (8) acceleration (early kindergarten admission, grade and subject skipping, mentorship); (9) enrichment (teaching models); and (10) program evaluation (administration, staff development and teacher support). (CL)

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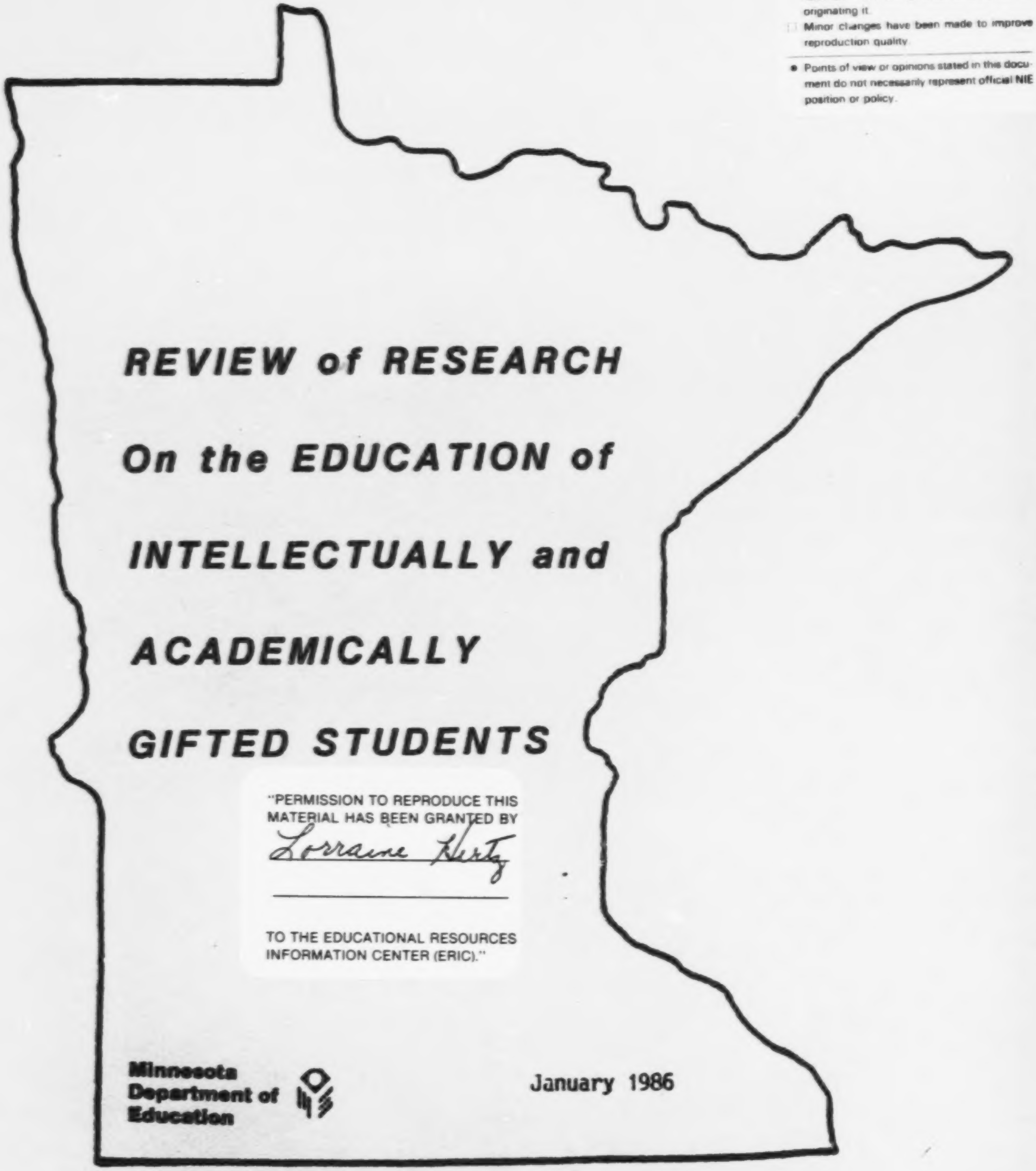

REVIEW of RESEARCH On the EDUCATION of INTELLECTUALLY and ACADEMICALLY GIFTED STUDENTS

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Preface

Students who are capable of high performance are identified through either demonstrated achievement or potential ability in several areas singly or in combination. This document reviews research and literature dealing primarily with students whose abilities are in the intellectual and academic areas.

It is anticipated that a further review of literature and research will be conducted in the areas of creative and productive thinking, leadership ability, and visual and performing arts. These findings will be published as an addition to this document.

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SECTION ONE: IDENTIFICATION OF THE GIFTED AND TALENTED

Over the past decade, the number of gifted students identified has doubled, according to the United States Office of Education. Despite this positive statistic, still fewer than 5-10 percent of potentially gifted students' needs have been served. Richert, Alvino & McDonnel (1983) have suggested that two major barriers have persisted in preventing the full identification of all students with potential gifts:

1. myths or confusion about the definition, characteristics and needs of the gifted; and,
2. the gap between research and actual practice in the unbiased identification of gifted and talented youth.

Indeed, even the labels which groups of gifted students are given may cause confusion. Table One presents reference points for groups under discussion.

Table One: Reference Points for Groups Under Discussion

Label	Total of General School Population	Estimated Proportion of School Population in Favorable Socio-Economic Community	Binet IQ Reference Point
Academically Talented	15-20%	45-60%	116 and over
Gifted	2.4%	6-12%	132 and over
Highly Gifted	.1%	.3%	148 and over

It is difficult to review the research on identification of talent without an understanding of intelligence testing. In a review of the most recent research on testing, Gallagher (1985) stated that the intelligence test remains one of the strongest measures of intellectual giftedness. Although it is clear that IQ tests do not measure all of what may be considered a part of human intelligence, they do measure much of what is necessary for predicting academic attainment and success. Table Two displays several maximum obtainable IQ scores on a variety of widely used intelligence tests.

Table Two: Maximum Obtainable IQ Scores on Tests of Intellectual Ability at Two Different Age Levels

Intelligence Test Name	Maximum IQ 12 Years Old	 14 Years Old
Stanford Binet Intelligence Scale (3rd rev.)	170*	159*
Wechsler Intelligence Scale for Children-R	154*	154*
Otis Quick Scoring Test of Mental Ability (Beta)	153	143
California Test of Mental Maturity (Elementary)	157	136
Lorge-Thorndike Intelligence Test (Verbal)	147	150*

*Highest score given in norm tables

In recent years, there has been a tendency to move away from a single index of giftedness and to adopt a multiple index, which may include measures of intellectual aptitude, achievement measures, teacher ratings, peer nominations, parent identification, and so forth. The degree to which there is diversity in current identification practices may be judged by a recent survey of 200 school district identification practices. Alvino, McDonnel and Richert (1981) found that over 120 tests, rating scales, and other techniques were used across all five domains of giftedness recognized by the U.S. Office of Education definition. Fox (1981, 1108), in summarizing the existing literature on identification, concluded: "On the basis of existing research evidence, the most defensible approach for identifying the academically talented would appear to be the use of a variety of psychometric and nonpsychometric measures for initial screening."

Table Three (see next page) presents a summary of the basic methods used to identify gifted students along with the limitations of these methods.

Based on their 1981 survey, Alvino et al documented the widespread misuse and abuse of tests in identifying for giftedness among cultural subgroups and in identifying for giftedness across the five domains recognized in the federal definition. It became apparent that national identification practices reflected a flagrant use of tests and instruments with populations on which they were not normed and for which they were never intended. In many cases, the misuse betrayed an indiscriminate conflagration of categories of the federal definition. Therefore, in 1983, the researchers convened an Identification Conference, the objective of which was to make recommendations for the most appropriate measures to be used in identifying the gifted for each domain of the federal definition. Table Four (see page following Table Three) displays the specific recommendations of that conference.

Table Three: Summary of Methods for Identifying Gifted Children

METHOD	LIMITATIONS
Teacher Observation	May miss underachievers, culturally deprived, motivational problems, emotional problems, and children with belligerent or apathetic attitudes toward school. Definitely needs supplementing with standardized tests of intelligence and achievement.
Individual Intelligence Tests	The best method, but expensive in use of professional time and services. Not practical as general screening tool in schools with limited psychological services.
Group Intelligence Tests	Generally good for screening. May not identify those with reading difficulties, emotional or motivational problems, or cultural impoverishment.
Achievement Tests	Will not identify underachieving gifted children. In addition, same limitations as group intelligence tests.
Creativity Tests	New and of uncertain validity. Show promise of identifying the divergent thinker who may be overlooked on IQ tests. May be too narrow in scope to be used without being supplemented by other measures.

Table Four: Recommended Commercial Tests for Identification of Giftedness in Domains Recognized in the Federal Definition

TEST	DOMAIN	RANK
Stanford-Binet Intelligence Scale	General Intellectual	1
Cognitive Abilities Test	General Intellectual	2
Lorge-Thorndike Intelligence Tests	General Intellectual	3
Wechsler Intelligence Scale (Children)	General Intellectual	4
Henmon-Nelson Tests of Mental Ability	General Intellectual	5
Iowa Tests of Basic Skills	Specific Academic	1
Stanford Achievement Test	Specific Academic	2
California Achievement Test	Specific Academic	3
Metropolitan Achievement Test	Specific Academic	4
Differential Aptitude Test	Specific Academic	5
Torrance Tests of Creative Thinking	Creativity	1
Creativity Test for Children (Guilford)	Creativity	2
Structure of the Intellect - LA (Creativity Subtests)	Creativity	3
Khatena-Torrance Creative Perception Inventory	Creativity	4
Renzulli-Hartman Scales (Creativity)	Creativity	5
Biographical Inventory (BRIC)	Creativity	6
Preschool Talent Checklist	Creativity	7
Test of Creative Potential	Creativity	8
Barron-Welsh Art Scale	Visual/Performing Arts	1
Horn Act Aptitude Inventory	Visual/Performing Arts	2
Meier Art Judgment Test	Visual/Performing Arts	3
Musical Aptitude Profile	Visual/Performing Arts	4
Seashore Measure of Musical Talents	Visual/Performing Arts	5

No measure or instrument presently in use was recommended for the leadership domain.

In the current turmoil over intelligence testing, many researchers have called for ways to measure mental ability that will be fairer, more precise, and more relevant to real life than those now used. Fortunately, these demands come at a time when research into intelligence measurement has produced several dozen innovative approaches. Rice (1979) and Turnbull (1981) have independently suggested that future intelligence test takers might, for example, be:

1. Listening to clicks in earphones while electrodes taped to their temples send brain responses to be analyzed by a computer. Beck (1979) developed a test which measures the extent of electrical activity with an electroencephalograph in response to such sensory stimuli as sounds or flashes. Neurophysiologists then sort out the minute changes that occur when a repeated stimulus stops or fails to continue in a predictable pattern. It is believed that the brain gradual-

ly disregards a regular sequence as it loses its novelty. As the interruption recaptures the brain's attention, the measured response gives a distinct measure, termed the "evoked potential," which can be statistically compared with normed responses and IQ data.

2. Held, as infants, by their parents while they watch toy cars roll down a ramp and knock over toy dolls. Kearlsey (1981) has used the electrocardiogram attached to a child's chest to record changes in heartbeat during such tests. The 45-minute test centers on three auditory and two visual episodes, similar in principle to the "evoked potential" procedures. The speed with which the child responds to changes in the visual or auditory routines of the doll and car is believed by Kearsley to provide a relatively uncontaminated measure of mental ability, unbiased by physical, social, economic, or cultural handicaps.

3. Tested on mental abilities that may be influenced by watching television regularly. The Educational Testing Service, as reported by Fallows (1980), has attempted to explain the consistent decline in test scores on the College Board Scholastic Aptitude Tests (SAT's) by suggesting that the present generation of students are a more "visual" generation, growing up not only with television, but also with electronic toys, hand calculators, home computers, and audiovisual aids. As a consequence, these students have learned to receive and process information differently from those reared in the print age. Thus, it may be that tests like the SAT, that have been designed for print-oriented people, may put the present generation at a disadvantage. Many psychologists, also known as "cinepsychometrists," such as John Horn at the University of Denver, have developed audiovisual testing, which increase reliance on visual, auditory and manual aspects of intelligence previously unmeasured by standard paper and pencil tests (Horn, 1979).

4. Describing whether or not they prepare their own lunch, and relating how many pupils they know in their class by name. Researchers such as Jane Mercer (1979) and Christopher Jencks (1980) have devoted much time and effort to the development of adaptive-behavior inventories. Such researchers have argued that only slight correlations have been found between IQ and successful performance in later life. A number of useful coping skills have been identified by such researchers as possibly more crucial components of intelligence than such traditionally tested skills as spatial orientation and analogical reasoning: (1) getting attention from adults and peers; (2) using other people as resources; (3) expressing affection and hostility; (4) recognizing these emotions in other people; (5) being willing to accept substitutes for things wanted; (6) perceiving awkward or embarrassing situations; and, (7) being sensitive to verbal and facial expressions.

5. Deciding at age three-and-a-half, they would respond if they were in a game with three children and only two wanted to play. Sigel and McGillicuddy-Delisi (1980) have devised a series of "what if" social situations with three-and-a-half year olds, measuring the strengths of adaptability in their initial strategy selections and the quality of their fallback strategies. Thus far, much of this research has found that children's social behavior tends to reflect not only their sex, but also family structure and parental beliefs; nevertheless, the importance of tests of interpersonal skills cannot be underestimated. Sternberg (1982), among others, has argued that social competence is probably the singlemost important indicator of successful adaptation to one's environment, measuring, above all else, the ability of a person to extract the most important information about coping from a complex social context.

It is well known that most people do better on some tests of mental ability than on others. Over the past two decades, researchers have discovered that people tend to have distinctive and relatively consistent patterns of thinking, perceiving, and problem-solving. These tendencies, known to researchers as "cognitive styles," include such dimensions as:

1. Convergent versus Divergent Guilford (1967), among others, has argued that convergent thinkers tend to reach logical conclusions based on conventional reasoning and generally do well in scientific activities. Such minds do better on multiple-choice tests that require finding one correct answer. Divergent thinkers tend to be more creative, coming up with original and novel responses that can lead them into less structured careers. These minds are better suited to open-ended questions that allow for a number of alternative possibilities.

2. Field Independent versus Field Dependent "Field independents" characteristically concentrate on the big picture and tend to think independently of the surrounding context of a situation. They are generally more capable of tasks requiring logical ability, and may be somewhat impersonal and insensitive to social surroundings. The "Field Dependent" typically concentrates on internal details, tends to be less analytical, more socially perceptive, and more subject to external influence. Much of this cognitive style may be culturally influenced (Witkin, Dyk, Faterson, Goodenough & Karp, 1962).

3. Scanning versus Focusing "Scanners" tend to go meticulously through the details of a situation, whereas "Focusers" tend to fix their attention on only a few key details, ignoring peripheral cues that occasionally may be important. Researchers have developed written descriptions and videotaped portrayals of complex social situations which appear to discriminate well between these two cognitive styles (Zelniker, Openheimer & Renan, 1975).

4. Right Brain versus Left Brain In oversimplified form, it is thought that each half or "hemisphere" of the brain may be responsible for certain mental abilities, the left side generally handling logical and verbal functions, the right side taking a major responsibility for intuitive, emotional, and spatial abilities. Chen (1981), among others, has suggested a connection between hemispheric preference and whether a person above a 130 IQ threshhold develops as "intellectually" gifted (left hemispheric preference in problem solving) or "creatively" gifted (right hemispheric preference).

5. Masculine versus Feminine Whatever the ultimate causes of the research-established differences between the sexes, the differences do exist, albeit of small but significant degree. Men tend to have better spatial ability (Fennema, 1977) and women better verbal ability (Block, 1981). Women seem better able to focus attention on one particular task while men perform better on tasks requiring simultaneous use of more than one mental skill (Fox, 1977). Table Five (see next page) summarizes the synthesis of research on cognitive differences between males and females as noted by Jensen (1980).

Table Five: Number of Studies of Sex Differences and Their Outcomes on Various Types of Tests Published Since 1966.

TYPE OF TEST	N	Significant Difference in Favor of		
		MALE	FEMALE	NEITHER
		%	%	%
General Intelligence	58	5	26	69
Verbal Ability	131	10	28	62
Quantitative Ability	35	46	11	43
Visual-Spatial (Non-analytic)	35	26	6	68
Visual-Spatial (Analytic)	63	40	5	55
Reasoning (Nonverbal, nonspatial)	38	18	13	69
Piagetian Tests of Conceptual Level	51	12	8	80
Divergent Thinking (Verbal)	32	16	34	50
Divergent Thinking (Nonverbal)	23	35	35	30

As can be seen, the strong finding on this chart is that visual-spatial (analytic) skills favored males in forty percent of the studies reviewed, while just five percent favored females. Based on his inbreeding study in Japan involving marriages between cousins, Jensen (1982) proposed that visual-spatial ability is a sex-linked, recessive trait. According to his research, inbreeding has the effect of improving a skill that is recessive, but decreasing a skill that is dominant. Since visual-spatial abilities tend to increase with inbreeding, Jensen concluded that the trait must be a biologically determined, sex-linked recessive characteristic carried through females to males. Other researchers have argued that much of the differences observed between males and females may be influenced by cultural stereotypes (Usiskin, 1982; Fox, 1977), by unequal training (Benbow & Stanley, 1983; Parsons, 1982), by unequal teacher and school expectations (Ernest, 1976; Brophy, 1982; Brody & Fox, 1980, Casserly, 1979), differential responses to peer expectations (Feldman, 1982; Parsons, Frieze, and Ruble, 1978; Trigg & Perlman, 1976), and differential family expectations and identification (Radin & Epstein, 1975; Altman & Grossman, 1977; Marini, 1978).

It is generally understood that intelligence tests are implicit measures of potential for learning. One recent direction in psychometric research has focused more directly on measuring learning potential by giving children unfamiliar problems and measuring the number of "prompts" or the amount of coaching the children need before they can solve them. Reuven Feuerstein (1980) and Brown & French (1979) have worked on the development of test-teach-retest methods for children aged 12 or older, which use relatively culture-free measures of nonverbal ability. Researchers at the Educational Development Center in Boston (Rice, 1979) have designed an assessment battery for grades one to six, called "Torque" (Tests of

Reasonable Qualitative Understanding of the Environment"), which measures and probes learning potential with a variety of different contexts and formats, such as games and puzzles. Open discussion is encouraged between examinee and examiner about the test items, so that the examiner can find out how well a student can perform a task, not how fast. Sternberg & Davidson (1982) have agreed with this approach in their arguments that a distinguishing characteristic of the most intelligent may be the way in which they distribute time in solving a problem. The most highly intelligent are thought to spend more time on "front end analysis" (planning solution strategies and encoding the context of the problem) than on direct confrontation with the words or situation of the problem setting (Sternberg, 1981; Mulholland, Pellegrino & Glaser, 1980; Hagen, 1979; Ludlow & Woodrum, 1982).

A basic question that must be asked when one discusses issues in the identification of the gifted and talented is: **Do gifted students learn and think differently?** In general, the answer must be that there are differences and that these differences are ones of degree. The gifted can be understood in the same terms as average persons, except that in the dimensions used to describe human beings, the gifted are at one extreme. It is true, of course, that quantitative differences, taken at extremes, do seem to be qualitative as well. Also, gifted persons have quite different patterns of experience in school and in life in general, and this undoubtedly leads to discernible differences of many kinds. For example, the gifted person may be expected to solve more problems successfully than persons of lesser ability and thus to develop a concept of self which shows larger degrees of self-control. This is sometimes described in terms of locus of control. Two large studies (Milgram & Milgram, 1976; Messer, 1972) confirmed that the gifted are more likely to have an internal locus of control than the nongifted. Locus of control describes a person's perceptions of his/her performance as contingent on personal effort (an internal locus) or due to luck, the whims of others, etc. (external locus of control). Messer (1972) studied differences in locus of control among male and female gifted groups and found a very interesting additional difference. High achieving gifted males were significantly more willing to take credit for their successes than were the females; conversely, the high achieving female gifted group was much more willing to accept blame for its failures than were the males.

Piaget's views about the development of intelligence show how differences that in one sense are quantitative also become qualitative. According to Piaget's theory, all learners develop their cognitive abilities by proceeding through a series of four general stages of cognitive development. Two hypotheses have been advanced concerning individual differences in gifted learners as they advance through the progressive stages.

Hypothesis One: All learners traverse the same stages of cognitive development in the same order, but the gifted progress at a significantly more accelerated rate within each stage, thus reaching the formal operations stage at an earlier age. Many research studies have confirmed this basic hypotensis (Webb, 1974; Keating, 1975; Carter & Kontos, 1981; Weisz & Zigler, 1979). A few studies were inconsistent with this hypothesis (Roberge, 1976; Rader, 1975; Kuhn, 1976; Brown, 1973), but, interestingly, all of these latter studies dealt with the pre-operational stages in attempting to measure the relationship between psychometric and developmental theories of cognition.

Hypothesis Two: Gifted learners excel in performance on certain tasks within each stage of development. The more complex tasks at any developmental level tend to be successfully accomplished by the gifted at a significantly earlier age than for nongifted groups (Shigaki & Wolf, 1980; Kemler, 1978). Carter & Kontos (1981) have perhaps best organized what we know about the relationship between Piagetian theory and giftedness. Their conclusion was that all children appear to traverse the sensorimotor and preoperational stages in approximately the same number of years (that is, the gifted don't get to the concrete operational stage significantly earlier than do the nongifted). However, age 6 and the beginning of the concrete operational stage, the gifted do traverse this stage at a significantly accelerated rate, reaching the formal operations stage at least two years earlier than other learners.

A further perspective on the nature of differences between gifted and nongifted persons is provided by Robert Sternberg (1981). Sternberg has argued that there are five kinds of components present in human information processing in order for humans to solve problems. The first component is the *metacomponents*, those higher order processes used for executive planning and decisionmaking in problem solving. As several representative metacomponents are enumerated below, we shall see that the gifted do, to a significantly greater degree:

1. recognize the problem to be solved (Kemler, 1978; Zimmerman, 1981; Coleman & Fults, 1982);
2. readily generate series of solution steps (Hermelin & O'Connor, 1980);
3. set priorities for the direction to take in solving a problem (Wong, 1983);
4. select representations of information more like an "expert" would (Barkovich & Mezynski, 1981; Sternberg, 1981);
5. decide which resources to allocate to a problem-solving task (Sternberg, 1982; Wong, 1983; Fischer, Hunt & Randhawa, 1978); and,
6. monitor solutions systematically (Spitz, 1982).

A second component identified by Sternberg also shows significant differences between gifted and nongifted learners. The **performance** component includes those processes used in the execution of a problem-solving strategy, such as encoding, application, mapping, inference, and justification. Two major differences have been observed between gifted and nongifted learners in the use of this component. To a significantly greater degree, the gifted:

1. execute these processes more rapidly and successfully in all tasks of *analogical thinking* (Sternberg, 1982; Miller, 1979);
2. execute more rapidly, learn more, select more efficient strategies, and respond more rapidly and accurately in problems dealing with *memory* and *attention* (Sternberg, 1981).

Sternberg described three other components of problem solving: **acquisition components** -- skills in learning new information, **retention** - skills in retrieving previously acquired information, and **transfer** - skills in generalizing retained information from one context to the next. These are components on which gifted and nongifted persons have traditionally been found to be different; that is, the gifted learn more, retain better and generalize more readily and accurately than do nongifted populations.

In emotional and social characteristics associated with the school setting, significant differences were also found. Gifted students tend to have higher concepts of themselves as learners than do others, especially of they are placed in high ability grouping or programs (Ketcham & Snyder, 1977; Rogers, Smith & Coleman, 1978). Academic self-concept tends to decrease with age, such that by high school years, gifted students do not vary significantly from nongifted in how they view themselves as learners (Klein & Cantor, 1976; Stopper, 1979).

In interpersonal sensitivity, the gifted showed superiority in "reading" the feelings of others toward themselves in the school setting. Ritchie, Bernard & Shertzer (1978) reported that this sensitivity exhibited itself at a much earlier age in the gifted. Puckett (1980) described gifted superiority in the ability to identify: (1) non-verbal cues; (2) positive-submissive behaviors; and, (3) negative-dominant behaviors in teachers. Abroms (1981) looked at the perspective-taking of gifted and nongifted children, concluding that the gifted possessed significantly higher levels of affective (i.e., empathy), visual (i.e., being able to perceive objects from unusual perspectives), and conceptual (i.e., able to understand new, unusual ideas) perspective-taking.

In social cognition, the ability to get along with others and to manage social situations in the academic setting, the gifted have shown differential advancement. Several studies pointed out that the gifted exhibited social cognition at an earlier age than did nongifted populations (Abroms & Gollin, 1980; Jordan, 1981; Scott & Bryant, 1978). There was not, however, any strong correlation between advanced social cognition and advanced or more mature social behavior!

Attitudes toward learning were also found to be more favorable among the gifted populations studies than for other groups (Bracken, 1980; Ross & Parker, 1980).

Likewise, social acceptance was reported to be significantly higher for the gifted so long as their measured IQ's remained below 150. Beyond that threshhold, teachers reported the gifted to be less popular and socially accepted than their nongifted counterparts.

The emotional differences between gifted and nongifted students were also found to be significant. The gifted were significantly higher in:

1. intelligence -- a preference for thinking about things in a generalized or abstract way (Welsh, 1978);

2. emotional stability (Welsh, 1978);

3. motivation, as rated by teachers (Welsh, 1978);

4. general emotional health (Reynolds & Bradley, 1982);

5. confidence in interpersonal interactions (Kaiser, 1981);

6. sense of personal worth (Lehman & Erdwins, 1981);

7. knowledge of social skills (Lehman & Erdwins, 1981);

8. sense of personal freedom (Lehman & Erdwins, 1981);

9. anti-social tendencies (Lehman & Erdwins, 1981); and,
10. cooperation as adolescents (Lehman & Erdwins, 1981).

Correspondingly, the gifted were found to be significantly lower in the following emotional characteristics:

1. levels of anxiety (Reynolds & Bradley, 1982);
2. nervous symptoms (Lehman & Erdwins, 1981); and,
3. willingness to compromise (Lehman & Erdwins, 1981).

As one reviews the characteristics suggested as typical of gifted and talented students, it is important to be mindful that our knowledge of gifted students is still very incomplete. Although one could draw up a portrait of gifted students using many of the descriptions which emerge from this research, such a portrait would be inaccurate for many individuals. Every gifted child will not exhibit all of the characteristics suggested by the research. None of the characteristics listed is strictly limited by or exclusive to gifted students. Rather, they are dimensions of ability, development and attitudes on which gifted students tend to be favored. In the main, these differences are quantitative, rather than qualitative, but as noted earlier, big quantitative differences do tend to produce qualitative differences over time. As researchers have repeatedly concluded, there is probably more to giftedness than just a set of identifiable traits.

SECTION TWO: RATIONALE FOR SPECIAL PROVISIONS

Research on stability and change in human characteristics reveals that it is possible to maximize the development of a particular characteristic such as height, intelligence, or school achievement. It is also possible to retard or stunt a particular type of development under certain environmental conditions. (Bloom, 1964; Bloom, 1981; Bennett, Rosenzweig & Diamond, 1969).

Many young gifted children amply demonstrate through their performance that they can profit from early or accelerated instruction. Children who read before the age of school entry, who understand mathematical concepts commonly taught to far older children, and who have exceptional talents and possess wide knoweldge, also tend to be generally more mature than others their age (Abroms & Gollin, 1980; Ritchie, Bernard & Shertzer, 1982). It should not be necessary to retard their development until they attain an arbitrary chronological age required for school entry. Careful studies have shown that very early reading, as early as two years, when self-introduced, does not harm gifted children (Brown & Rogan, 1983). Gifted children are ready to profit from many of the experiences reserved for older youngsters. Special preschool groups with appropriate experiences or early entrance into kindergarten or first grade might help to maintain their interest and accelerated progress in learning (Maddux, 1983).

The phenomenon of regression has been established in comparing gifted first grade pupils in special programs with equally gifted pupils in regular classes with no provisions. The gifted in special programs, who were allowed to learn without restriction, gained an average of two academic years during a single year, while the gifted controls gained only the usual one year (Martinson, 1973). The latter represents educational retardation, if the ability of the controls is considered. It may well be ascribed to the well-known desire of young children to conform to teacher expectations. (Abroms, 1981; Hollingsworth, 1976).

The differences in psychological and academic areas, interests and capacities have been well documented (as in, for example, Leukhardt, 1981; Colangelo & Kelly, 1983; Van Tassel-Baska, 1983; Trollinger, 1983; Welsh, 1978). It may be argued, therefore, that unless special provisions are made, problems may result., Studies of children with exceptional abilities have shown that these persons typically performed far below their capacity, that they found their educational experiences frustrating, that developmental disharmonies between high intelligence and adequate physical ability caused problems, and that they often felt inferior, inadequate, and insecure within their peer group (Witty, 1962; Haier & Denham, 1976; Ross & Parker, 1980; Klein & Cantor, 1976; Stopper, 1979; Albert, 1980; Michael, 1977).

The highly gifted are found to receive little understanding and emotional support from school and community. Their chances for attaining genuine group leadership have been very slight, most of them tending to follow rather than lead in attempts to adjust to group mores. The higher the ability, the greater the conflict and inconsistencies between the culture and the individual in values, standards, concepts of behavior, and ways of life (Albert, 1980; Austin & Draper, 1981; Hollingsworth, 1976).

When conditions are changed and the gifted and talented are given opportunities to satisfy their desires for knowledge and performance, their own sense of adequacy and well-being improves. Those who can function within an appropriate learning milieu also improve in their attitudes toward themselves and others (Kaiser, 1981; Stopper, 1978; Stark & Stanley, 1978; Coleman & Fults, 1982).

The question of elitism, separation, and lack of contact with others assumes a different perspective if we accept the thesis that people who can make satisfactory contacts with others are secure about themselves and in a better position to make satisfying contacts with others than are those who feel alien, unaccepted, and frustrated. If education and life experiences for the gifted are what they should be, the likelihood that the gifted and talented will relate to the total society and work within it is actually enhanced (Marland, 1971).

Studies of a wide variety of special provisions for the gifted and talented have shown that special adaptations to improve learning opportunities have produced favorable social results (Gallagher, 1985). In a classic study of social relationships in one state program, pupils from rural schools who attended Saturday classes showed significant gains in social status within their regular classrooms, despite the fact that their peers were completely unaware of the special work. The total group of 191 fifth and sixth grade pupils showed highly significant gains in social status on the basis of responses by their peers in regular classroom settings. Children in special part-time groups showed no loss in social status from regular to special class ratings (Martinson, 1973).

There has been considerable theory suggested that there is a so-called "critical period" in which a child's gifts must receive appropriate stimulation if the gift is going to be fully developed. It is believed that insufficient stimulation during such periods will result in permanent inability to fully develop the potential (Bennett, Rosenzweig & Diamond, 1969; Feldman, 1979; Gardner, 1983).

The importance of environment cannot be underplayed in the development of giftedness. In twin studies where identical twins were of identical genetic makeup but reared in different environments, it was found that environment played a large role in an individual's continuing development until the age of thirty (Gallagher, 1985). In a synthesis of research, Taylor (1971) concluded that heredity may account for 65-85 percent of one's exhibited giftedness with a range of 35-15 percent accounted for through a suitably rich environment for the development of intelligence.

In other words, unusual early accomplishment requires something more positive than merely "not interfering" with the development of the gifted child. Feldman (1979) in his work with chess and music prodigies concluded that positive encouragement and training in the demonstrated potential area of giftedness is an absolute necessity.

SECTION THREE: TALENT LOSS

The concept of talent loss includes two very different sets of circumstances. The first involves easily identified academically talented students whose ability can be recognized through tests of intelligence and achievement. These students often voluntarily drop out of the educational system. The second type of talent loss represents a set of circumstances where intellectual potential is not easily recognized by standard intelligence tests because educational deprivation intervened to prevent the full development of the student's potential. For both groups of circumstances, the loss rates are substantial. The classic study of such loss was reported by Flanagan (1964) concerning Project Talent. A total of 440,000 high school students from 1300 schools were given comprehensive examinations. It was found that twenty percent of the students in the top quarter of their graduating class failed to enter college during a time when forty-three percent of the total high school population were entering college within a year of high school graduation. Gallagher (1985) has reported that only one percent of the Native American population continues their further education. The statistics for gifted Blacks are somewhat more encouraging: Davis & Rimm (1985) reported that by 1977, 76 percent were graduating from high school as were 58 percent of the Hispanic population. Gallagher (1985) concluded, however, that a very small percent of these high school graduates do go directly on to enter college. Other minority groups show similar deficits in the proportions in attendance in higher education.

According to the United States Department of Commerce Statistical Abstract (1985), the lifetime income differential for high school and college graduates is considerable. Taking the most conservative estimates possible, by age 55, the male college graduate will have outearned his high school counterpart by $120,000 (in actual 1981 dollars), and if he attends a fifth year of college, that differential increases to $174,000. For females, the income differential for college graduate and five-year college graduate over the high school graduate are $32,000 and $71,000, respectively. According to the Project Talent study mentioned previously, twenty percent of high school graduates in the top quarter of their classes do not go on to college. In 1984, 55,376 students graduated from Minnesota public high schools. In Minnesota alone, twenty percent of the top quarter would comprise approximately 2,768 high school graduates who do not go on to college, making a total talent loss for Minnesota for the year, 1984, of $332,160,000.

SECTION FOUR: NEEDED PERSONNEL

One generalization that can be drawn from the literature in gifted education is that special programming for gifted children requires additional personnel and services. We should disabuse ourselves of the notion that already overworked teachers and administrators can absorb one more special program into the already overcrowded and understaffed general program. It is wishful thinking to suppose that hard-working teachers without sufficient content knowledge, without special knowledge of gifted children, without time for planning programs, and with limited assistance from supervisory personnel will be able to alter, in any meaningful degree, the educational situation for gifted children.

Providing special preparation for every teacher who will interact with gifted and talented students has been emphasized by many researchers (for example, Martinson, 1973). However, the scope of such a task may be overwhelming. The National Center for Educational Statistics estimated that there are approximately 1.2 million elementary school teachers and 800,000 secondary teachers in the United States (Dearman & Plisko, 1981). The task of retraining any substantial number of this huge force is staggering both in terms of effort and cost. For example, if it were planned to prepare just 100,000 teachers from this total force -- about five percent of those now employed -- at forty teachers per summer workshop, five hundred workshops would be required. If each workshop costs $5,000 to operate, the total cost would come to $12.5 million. Even if that sum of money could be found, it would be necessary to find 2,500 specialists capable of conducting such workshops. Such a retraining effort would then have to be continued over decades to retrain even a minority of the total teacher force. Gallagher (1985) has suggested that one meaningful alternative to formal teacher-training programs might be to focus our interests on the preparation of trainers or administrative leaders for each state who would then organize and conduct training programs within their own states. Many other researchers have suggested alternative teacher preparation frameworks, including Gear (1974), Maker (1975), Renzulli (1973), and Sisk (1975).

That special preparation of teachers of the gifted is becoming increasingly necessary has been well argued in the recent literature. Renzulli (1985) reported a recent court decision which allowed a teacher of the gifted to retain her position instead of being replaced by a regular classroom teacher with more seniority but not gifted training. The specialization of training required to function as a competent and effective teacher of the gifted has been legally recognized in at least this one instance. Correspondingly, the winter issue, 1980, of the Detroit College of Law Review cited several cases in which the "right to an appropriate education" for special students, including the disadvantaged and the gifted, was supported in the courts (Mills vs. Board of Education of the District of Columbia; PARC). In the "Lau vs. Nichols" decision, the Supreme Court ruled that "there is no equality of treatment merely by providing students with the same facilities, textbooks, teachers, and curriculum..." With such legal nudging, it is becoming increasingly apparent that school districts will be required to provide specialized, trained teachers to manage the education of the gifted and talented in the near future.

The goal of any special preparation program for teachers of the gifted would be to modify teacher characteristics and competencies. Seeley (1979) conducted a national survey of university personnel, educational administrators and teachers on the desired teacher competencies for education of gifted and talented children. The recommendations emerging from that survey were:

1. Teachers specifically assigned to teach gifted and talented children should hold master's degrees in the field.

2. State certification and endorsement standards should be mandatory, with provisions for a permissive phase-in until sufficient qualified professionals become available.

3. Information concerning gifted and talented children should be a part of every teacher's training.

4. One to two years of successful teaching experience should be required of teachers before assignment to gifted and talented special programs.

5. Teachers of the gifted and talented should have strong content area emphasis in their background.

6. Teachers should have a variety of special competencies for teaching gifted children.

Several studies have looked at what gifted students perceive as desirable characteristics and competencies of the teachers they feel are most influential and effective. Martinson (1983) listed these characteristics as:

1. encourages self-selection of materials

2. clarifies classroom goals and purposes using broad concepts rather than detail

3. selects questions that stimulate high level thinking

4. encourages independent thinkiing, including difference of opinion

5. is unthreatened by own mistakes.

Dorhout (1983) reported, in a large study of several hundred academically talented students, that these students rank-ordered (1) enthusiasm for specific content area, (2) sense of humor, and (3) intelligence as the three teacher behaviors found in their most "effective" teachers.

In a synthesis of previous research on what is known to be preferred personal characteristics, predispositions and teaching behaviors of those who are successful in their work with gifted learners (Lindsey, 1980), the following list was generated:

1. Personal Characteristics: understands, accepts, and likes self; has outstanding ego strength; is sensitive to others; is above average intellectually; exhibits an intellectual style of conceptualizing; is flexible and open to new ideas; has intellectual interests; desires to learn and has high achievement needs; is enthusiastic; is intuitive and perceptive; is committed to excellence; feels responsible for own behavior and consequences.

2. Personal-Professional Predispositions: guides rather than coerces or pressures; is democratic rather than autocratic; focuses on process as well as product; is innovative and experimental rather than conforming; uses problem-solving procedures rather than jumps to unfounded conclusions; seeks involvement of others in discovery rather than giving out answers.

3. Teaching Behaviors: develops a flexible, individualized program; creates a warm, safe, and permissive atmosphere; provides feedback; uses varied strategies; respects personal self-images and enhances positive ones; respects personal values; respects creativity and imagination; stimulates higher-order mental processes; respects individuality and personal integrity.

SECTION FIVE: UNDERACHIEVING GIFTED CHILDREN

Underachievement may be defined as a discrepancy between a student's school performance and some index of his or her actual ability, such as intelligence, achievement, creativity, or observational data (Rimm & Davis, 1985). There may be problems in attempting to measure any of these types of discrepancies, such as test unreliability and measurement error, test-taking anxiety or lack of skill in test-taking, use of a fixed number of months or years by which to categorize a student as underachieving (e.g., two years below grade level expectations), use of achievement test batteries that do not measure what the district curriculum teaches in that achievement area, and inconsistencies in classroom observation techniques.

Most of the early work on gifted underachievers was done by Terman and his associates in their 40-year longitudinal study on the characteristics of gifted individuals. In his 1947 follow-up study of the 1,528 school children initially studied in 1921, Terman and Oden compared 150 men who were judged to be "successful" (as determined by career status, income earned, number of patents applied for, and community standing) with 150 men from the same study who had the most trouble in their lifework in achieving their tested potential. Terman and Oden found that the key differences in these two groups lay not so much in their initial IQ scores as in the area of personality characteristics. On the rating scales that the men and their wives and parents completed, four areas were found that differentiated the successful and unsuccessful men: (1) lack of self-confidence; (2) inability to persevere, to stick to a task or to tolerate frustration while finishing a task; (3) lack of integration of goals and self-direction; and, (4) presence of inferiority feelings.

A little noted aspect of this study but one of significance to the schools, is that these same characteristics differentiated these two groups when they were ten years old. In other words, the school records of these youngsters could have differentiated the underachievers and achievers while they were still in elementary school. This points to the conclusion that these distinctive adjustment patterns do not go away naturally.

It is interesting and at the same time disheartening to note that the areas of motivation and underachievement received very little notice before the fears generated by the Russian launching of Sputnik, Fliegler & Bish (1959) reviewed research in this area and found that although there were numerous studies reported on underachievement, there was little net information regarding the factors that contribute to academic success or failure. During the period immediately after Sputnik, a rash of studies on underachievement appeared, all of which related academic accomplishment to intelligence, personality, identification with social class values, peer relationships, parental environment and the school milieu (for example, Haggard, 1957; Durr & Collier, 1960; Passow & Goldberg, 1958; Gowan, 1957; Bledsoe & Garrison, 1962; Shaw & McCuen, 1960). This period of time did contain a serious investigation into the problem of underachievement, unparalleled until the present time. Clark (1983) has described two types of underachiever: (1) the situational underachiever, who does not achieve at full potential with one particular teacher, and (2) the chronic underachiever, whose pattern recurs over a period of several years. Whitmore (1980) has synthesized much of the research findings up to the present time. She has concluded that the personality characteristics of the underachiever are in large part responsible for the problem behaviors that do occur, including unique needs for perfectionism, supersensitivity and a deficiency in social skills. Table Six (see next page) presents a summary of the most important traits which would indicate that a student should be further evaluated to determine if he or she is indeed a gifted underachiever.

Table Six: Potential Behavioral Indications of Underachievement

1. IQ of 140+ on Stanford-Binet or WISC
2. Schoolwork has been consistently incomplete
3. Gap between qualitative level of oral and written work
4. Test phobic, poor test results
5. Profound interest in a single area in which s/he is "expert"
6. School phobia or complete disinterest in attendance, participation
7. Low self-esteem, unhealthy self-concept
8. Belief that s/he is unliked
9. Autonomous spirit, quite focused on self, resistant to influence
10. Inability to function constructively in groups
11. Wide range of interests, mostly in sciences and arts
12. Tendency to continually set goals, standards unrealistically high
13. No satisfaction from repeated demonstration of acquired skills
14. Not motivated by the usual "devices," such as praise, rewards, etc.

The issue of early identification of the potential gifted underachiever cannot be overemphasized. Whitmore (1980) and Davis & Rimm (1985) argued that the gifted underachiever must be considered part of a "special population" of gifted learners, necessitating that special care be taken to use identification instruments unbiased against such special populations. Table Seven (see next page) provides a listing of promising practices for identifying giftedness in several special populations, including the underachieving (Richert, Alvino & McDonnel, 1983). This table should prove useful for future references in subsequent chapters of this review.

Rimm & Davis (1985) categorized the characteristics of gifted underachievers into three cause and symptom levels. Low self-esteem is the primary characteristic, evidenced by the students' lack of belief that they are actually capable of accomplishing what their family and teachers expect of them (Fine & Pitts, 1980; Rimm, 1983; Whitmore, 1980). Felton & Biggs (1977) have related this low esteem to an external locus of control, a feeling that if they fail a task it is due to their lack of ability. This attribution process then may lead to learned helplessness in which the student does not see the relationship between his efforts and the outcome and will no longer make an effort to achieve (Seligman, 1975).

The secondary characteristic of underachievement, according to Rimm & Davis, is avoidance behavior, often observed as assertions that school is irrelevant and that it is of no use to study material for which there is no use. Thus, they avoid effort and achievement to protect their precarious self-esteem (Covington & Beery, 1976).

Tertiary characteristics are the logical outcomes of avoidance, including deficient school problems, poor school concentration, home and school discipline problems (Fine & Pitts, 1980).

The literature on the causes for underachievement has also suggested that the interaction between the home environment and the personality of the underachiever may contribute to the problem. In a synthesis of research on this linkage, Clark (1983) concluded that the families of achieving and underachieving students differ significantly. The families of underachieving students are more likely to possess some of the following characteristics: (1) student is more dependent on the mother and is rejected by the father; (2) parents set unrealistic goals for the student such

MATRIX OF PROMISING PRACTICES

For Identifying the Disadvantaged Gifted and Talented

NATIONAL REPORT ON IDENTIFICATION,
E. Susanne Richert

GROUPS DISADVANTAGED IN IDENTIFICATION: / PROMISING PRACTICES	Inventories/Checklists	Information from Students	Interviews	Biograph. Data/Case Studies	Performance Eval.	Product Eval.	Norming for Subpop.	Culture Fair Tests	Language-specific Tests	I.Q. Tests	Instrumental Enrichment	Developmental Curriculum			
• Environmentally Disadvantaged:															
- The Poor	+	+	+	+	+	+	+	+	+	+	+	+			
- Minority Race/Culture	+	+	+	+	+	+	+	+	+	+	+	+			
- Rural/Urban	+	+	+	+	+	+	+	+	+	+	+	+			
- English as Second Language	+	+	+	+	+	+	+	+	+	+	+	+			
- Females (in specific categories)	+	+	+	+	+	+	+	+	+	+		+			
• Disadvantaged by Kind of Giftedness:															
- Creative	+	+	+	+	+	+						+			
- Exceptionally Intellectually	+	+	+	+				+			+	+			
- Visual/Performing Arts	+	+	+	+	+	+						+			
- Psychosocial/Leadership	+	+	+	+	+							+			
- Psychosocial/Human Relations	+	+	+	+	+							+			
- Psychomotor	+	+	+	+	+							+			
• Other Disadvantages:															
- Underachievement	+	+	+	+				+	+	+	+	+			
- Physical Handicaps	+	+	+	+							+	+			
- Learning Disabilities	+	+	+	+							+	+			
- Emotional Problems	+	+	+	+							+	+			

Table Seven:
Matrix of Promising Practices

that the student imagines self as "good" only based on accomplishment; (3) achievement may go unrewarded; (4) parents are less active and less supportive of students; and (5) parents are more restrictive and punitive.

Whitmore does recognize, however, that a variety of external factors exacerbate the patterns of underachievement witnessed, including society's pressure to isolate one who is different, inappropriate curriculum, counterproductive instructional styles, and punitive social climates created by classroom peers. There may also be differences between boys and girls in the numbers and patterns of underachievement. Whitmore, (1980), for example, reported that ninety percent of all referrals for placement in a special program for gifted underachievers in Cupertino, California, were boys. A strong argument has been made, however, that cultural underachievement among gifted females is quite widespread. Schwartz (1980) noted that even though more choices are open to women in recent years, they still find themselves in a no-win conflict between professional interests and education, on one hand, and pressure to fill the traditionally appropriate sex role, on the other. Davis & Rimm (1985) concluded that four factors contribute to the lower self-expectation and aspirations of females, ultimately leading to their underachievement: (1) a lower sense of competence (Crandall, 1969; Addison, 1981); (2) attributional differences: females tend to attribute their success to luck but their failures to a lack of ability while the reverse holds true for males (Deaux, 1976; Frieze, 1975; Post, 1981); (3) low achievement motivation (McClelland, 1976; Atkinson, 1974); and, (4) fear of success (Horner, 1969; Zinberg, 1974; Lavach & Lanier, 1975). A strong correlation between these four factors and the characteristics of underachievement listed by Whitmore (1980) exists. It is realistic to think that the five-step remediation model to be outlined subsequently (Rimm, 1985) might prove useful in helping teachers, counselors, and parents reverse this phenomenon in gifted females.

Rimm (1985) has developed a five-step process for reversing the long-standing patterns of underachievement. According to her plan, all five steps must be implemented simultaneously:

Step One The assessment of skills, abilities and home and school reinforcement contingencies.

Step Two Modification of reinforcements at home and school. In this step the school work is actively monitored by parents and teacher and meaningful rewards for work completed are given.

Step Three Changing the expectations of important others. The underachieving student must feel that others believe in his or her abilities. Jackson, Cleveland & Mirenda (1975) showed in their longitudinal research with bright fourth, fifth, and sixth grade underachievers, that positive expectations by parents and teachers had a significant long-range effect on achievement in high school.

Step Four Model identification. Bloom & Sosniak (1981) have noted the extreme importance of a strong identification with an achieving model if talent is to be developed. Since it is not likely that such a model exists in the home environment of the underachiever, it is important to match the student with an achieving person who will serve in that capacity for the student, be it family friend, teacher, counselor, psychologist, minister, scout leader, or doctor. Rimm & Davis (1985) listed six characteristics such a model must possess: (1) nurturance; (2) same sex; (3) similarities to child in some way; (4) openness; (5) willingness to give time; and, (6) sense of positive accomplishment.

Step Five: Correction of skill deficiencies

Both Whitmore and Pirozzo (1982) have supported the emphasis on a nonthreatening classroom and home environment for the gifted underachiever. As early as 1973, Martinson warned, however, that placing gifted children, whether high or low achieving, in the regular classroom may encourage them to regress to the achievement level of their classmates or result in the development of discipline problems or withdrawal to their own interests. Ziv & Doni (1977) found that self-concept among underachieving gifted actually exceeds increases in self-concept found among high achieving gifted when both are placed together in a special gifted program. The problem, then, is how to provide the challenge to the underachiever in a nonthreatening way!

SECTION SIX: CULTURALLY DIVERSE GIFTED CHILDREN

For the past twenty years, there has been increasing interest in providing educational opportunities to children from culturally diverse backgrounds. The vast majority of that concern, however, has focused on children in such programs as Head Start, Follow Through, and Upward Bound. Until the early 1980's, very little attention was directed to children with outstanding ability from these backgrounds. The terminology used to describe these groups -- culturally disadvantaged, educationally disadvantaged, disadvantaged, and culturally different -- seemed to imply a problem to be solved. Frasier (1979) suggested that the term, culturally diverse, might be a more accurate and neutral descriptor; hence, that term will be used in this review.

How to identify the gifted among culturally diverse populations is of major concern. When the usual identification instruments are used to identify across cultures, it is highly unlikely that the culturally diverse, gifted child will be identified. Too often these children will be performing at the level of an average or below average advantaged child due to their cultural orientation or to being forced to take tests in a "second" (i.e., English) language. Scruggs and Cohn (1983) concluded that the culturally diverse gifted must be identified upon superior potential rather than superior performance.

In reviewing typical identification methods and their usefulness for culturally different and economically disadvantaged populations, we must first begin with the intelligence test. This issue is very complex, in light of the frequent and continuing debates concerning the cultural bias of mental testing. Many researchers have argued that the lower than average scores of minority groups on both individualized and group intelligence tests are evidence of their discriminatory bias (for example, Clifford, 1981; Hoffman, 1964; Zacharias, 1977). Jensen (1976), on the other hand, argued that intelligence tests "show practically no evidence of differential culture bias...," and therefore, do predict school success for both minority and majority cultures. Likewise, Thorndike & Hagen (1977) concluded that intelligence tests are useful in predicting academic success and can suggest an individual's strengths and weaknesses. Zacharias (1977) listed a number of specific weaknesses in intelligence tests:

1. They demand an understanding of the test-maker's jargon.

2. Test items are often ambiguous, illogical, overprecise or not sufficiently precise, and tricky in appearance even when they contain no trick.

3. The tests tend to be frightening, penalizing, damaging to self-image and misleading for the placement of students in grade levels.

Educators and psychologists universally have agreed that culturally different students are more likely to have difficulty when taking tests of verbal ability, due to the fact that most of these tests are based on middle-class English. Researchers who have studied the language structures of subcultural languages such as black English, Hawaiian pidgin, Navajo and other Native American languages, have concluded that the linguistic structures, categories, and associations of these languages are significantly different (Baratz, 1974; Labov, 1974). Scruggs & Cohn (1983), Kryaniuk & Das (1976), and Schubert & Cropley (1972) have commented on the large verbal/performance discrepancies of Native American children when the WISC-R has been used and the IQ scores of the verbal and performance components have been separately scored. Witty (1978) noted that in addition to the language difficulties minority children may experience, there may also be bias resulting from lower expectations of success, lower test-taking motivation, and higher test anxiety levels, especially when the tester is not of the same culture. Researchers have consistently concluded that high anxiety results in lower human performance and test score (for example, Cronbach & Snow, 1977; Weiner, 1980). Generally speaking, then, a high IQ score is convincing evidence of high intellectual ability among culturally different and poor children, but average or low scores should be interpreted with caution.

The use of achievement tests to identify the culturally diverse follow the same arguments used for identification with intelligence tests. As with IQ scores, children who produce high scores on achievement tests show evidence of special kinds of giftedness (Davis & Rimm, 1985). Achievement tests alone, however, should never be considered a sufficient measure for the identification of gifted minority and poor children.

Although many researchers have noted that teacher nominations of giftedness are highly suspect and invalid (for example, Gallagher, 1966; Martinson, 1974; Rimm, 1977), this method of identification continues to be the most popular identification method used. The use of this nominating procedure will be greatly enhanced when teachers are trained regarding the characteristics of gifted minority children. Table Eight displays research-based characteristic differences between advantaged gifted students and gifted black children (Gay, 1978).

Table Eight: Comparative Characteristics of Giftedness

CONCEPTS FROM THE LITERATURE	MANIFESTATIONS OF GIFTED CHARACTERISTICS IN GIFTED BLACK CHILDREN
1. Keen observation	Picks up more quickly on racist attitudes and practices; may feel alienated by school at an early age.
2. Interest, ability in perceiving relationships	Seeks structure and organization in required tasks; may be slow to motivate in some abstract activities.
3. Verbal proficiency; facility of expression	May have large vocabulary inappropriate for the school setting; thinking in black English may hinder the facility of expression in standard English.
4. Questioning, curious, skeptical	Some ask too many "wrong" questions; some may have been conditioned to suppress questioning behavior.

Table Eight: Comparative Characteristics of Giftedness (continued)

CONCEPTS FROM THE LITERATURE	MANIFESTATIONS OF GIFTED CHARACTERISTICS IN GIFTED BLACK CHILDREN
5. Critical, evaluative, possessing good judgment	Explores in perception of relationships better or wiser choices; reads behavioral implications.
6. Creative, inventive, original	Makes up games and activities; expresses original ideas in other ways.
7. Power of concentration, long attention span	May find some have extremely strong concentration due to persistent noise in environment; may also express displeasure at having to stop an activity.
8. Independence	Need for less supervision is especially pronounced in black gifted.
9. Academic facility and strength	Good at basic school tasks; may not have high achievement due to inferior schooling.

Swenson (1978) constructed a list of characteristics for creative giftedness among culturally different and disadvantaged urban students. This list is displayed in Table Nine.

Table Nine. Characteristics of Creative Giftedness in Culturally Gifted Students

1. Repeats activities so that he/she can do them differently.
2. Invents imaginative lies.
3. Shows that he/she sees hidden meanings, cause and effect relationships that are not obvious.
4. Writes and illustrates stories without being asked to do so as an assignment.
5. Utilizes free time by making up games, making something from paper or materials as opposed to more structured activities.
6. Finds many answers to a situational question.
7. Lets his/her imagination "run" when writing a story; sees more possibilities.
8. Finds activities for spare-time work with little or no help.

Table Nine: Characteristics of Creative Giftedness in Culturally Gifted Students (continued)

9. Decorates the border of his/her paper when doing an assignment.
10. Doesn't let classroom events go unnoticed; questions them.
11. Builds and constructs things using unusual materials; uses ordinary materials in different ways.
12. Interrelates his/her experiences and draws on them with ease in discussions.
13. Doesn't copy other children's ideas in art.
14. Accomplishes things on his/her own without help.
15. Writes poems and stories in his/her spare time.
16. Asks unusual questions during class discussions.
17. Makes up his/her own ideas when the class does a project together.
18. Suggests to the teacher alternate ways of doing an activity.
19. Is willing to risk friendship to express his/her feelings or thoughts.
20. Enthusiastic about new activities in music and art.
21. Goes beyond what is required in class assignments; makes his/her work "fancier."
22. Comes up with fresh, original comments or an unusual correct answer when there is more than one correct answer.
23. Finds new ways to get attention.
24. Tries original ways to get out of work he/she doesn't want to do.
25. Takes the initiative when he/she wants to know something; reads or asks questions without prompting.

Clark (1983) compared the facilitating and limiting attitudes and abilities that appear to be culturally supported by a variety of subpopulations. (Table Ten). It is relatively easy to see that such behaviors are often not of the "teacher pleasing" variety when the classroom teacher is considering children for a gifted program.

Table Ten: Facilitating and Limiting Culturally-Supported Attitudes and Attributes

Subculture or Ethnic group	Facilitating culturally supported attitude or attribute	Limiting culturally supported attitude or attribute
Japanese, Chinese, other Asians	Ability to listen, follow directions. Attitudes favoring education. Respect for teachers. Attitude toward discipline. Serious, caring attitude toward own development. Test at or above norm on all tests of intelligence. High achievement motivation. Family unity, supportive of child's achievement.	Attitudes unfavorable to being in discussion groups. Little experience with independent thinking. Strong values for conformity. Quiet manner. Perfectionism makes learning from mistakes hard. Male viewed as more desirable sex. Critical self-concept.

Table Ten: Facilitating and Limiting Culturally-Supported Attitudes and Attributes (continued)

Subculture or Ethnic group	Facilitating culturally supported attitude or attribute	Limiting culturally supported attitude or attribute
Jewish	Tendency to test high on intelligence tests. Attitudes favoring education, personal improvement. High achievement orientation. Good at independent, abstract thinking. Confident, good self-concept. Verbal.	Often overly competitive. Perfectionist attitude can cause tension and frustration. Family pressure to achieve sometimes excessive, especially with males.
Black	Experience with independent action. Self-sufficient. Imagination and humor. Physical action oriented. Middle class blacks accept dominant society's middle class values, attitudes.	Limited experience with varied or extended language patterns. Sex role stereotyping. Lower class blacks have problems typical of disadvantaged populations.
Mexican-American	Attitudes of cooperation. Favor education through high school. Supportive family, community. Unusual maturity, responsibility for age. Good advice givers, planners, dispute judges. Like to try new ideas. Maintain meaningful adult relationships. Facility for learning second language.	Language of dominant culture unfamiliar. Depreciate education after high school. Attitudes differ on basic time, space reality. Against any competition. Sex role stereotyping. No experience with other cultural values. Emphasis on family.

Some researchers have attempted to deal with revising the teacher nomination procedure to better assist teachers in identifying the culturally diverse, minority, immigrant, and poor gifted children. Kranz (1981) has concluded that teachers can be trained to identify and accurately rate such students when specially developed multi-dimensional checklists are employed. Meeker (1981) has also found that certain subtests on the "Structure of the Intellect Test" (SDI), in addition to a renorming of SOI subtest scores, have led to reliable identification of the gifted among certain minority populations, including Asians, Native Americans, Mexican Americans, and blacks.

Davis & Rimm (1985) suggested that creativity tests can be very helpful in selecting minority and culturally diverse children for participation in gifted programs. The "Torrance Tests of Creative Thinking" (TTCT) have been particularly successful in this regard (Solomon, 1974; Torrance, 1971; Torrance, 1977). Studies by Rimm & Davis (Rimm, Davis & Bien, 1982; Rimm & Davis, 1976; Rimm & Davis, 1980) have indicated that the "Group Inventory for Finding Talent" (GIFT) and the "Group Inventory for Finding Interests" (GIFFI) tests are valid identifiers in both rural and urban disadvantaged populations.

The use of peer nominations may be of considerable value in the identification of giftedness among minority populations. Bernal (1978; 1979) noted that members of particular ethnic groups are extremely adept in identifying the "smartest" among their peers. Bruch & Curry (1978) have found that the use of students identified by their peers as out-of-school "leaders" has proven to be a valid identification method. It was reasoned that such leaders demonstrated creative approaches to self-maintenance and survival, which are often indications of giftedness.

Davis & Rimm (1985) concluded that a reasonable solution to the minority identification problem may be to establish a "quota system." This type of system assumes that the same percentage of minority students are gifted as majority students. A central issue with this solution is the fairness to majority students who would be excluded when, according to objective criteria, they would appear more qualified. If and when this particular issue can be resolved, many studies have argued that the quota approach is useful in identifying the "invisible" gifted minority student for inclusion in a gifted program (Hersberger & Asher, 1980; Berliner & Rosenshine, 1977; LeRose, 1978).

Many researchers have attempted to grapple with the second major issue with culturally diverse giftedness — how to develop this giftedness. Scruggs & Cohn (1983) concluded in their case study of a gifted eight-year old Pima Indian boy that "ability training in skill deficit areas should be among the very highest of priorities." Rimm (1976) suggested that for the disadvantaged child Maslow's hierarchy of human needs must have a cognitive hierarchical counterpart, as summarized in Table Eleven (see next page). Both hierarchies are based on "deficiency" motivation: the learner is motivated to provide for self needs at one level and if this requires frequent attention, he/she cannot grow or move upwards on the hierarchical ladder. For the disadvantaged, if deficiency needs are not met, then the gifted child in that culture is unlikely to perform. Davis & Rimm (1985) concluded that once the removal or reduction of basic skills deficits has occurred, then it will be possible to identify the gifted among the subpopulation, followed by provision of an appropriate program to develop the giftedness exhibited.

Table Eleven: Dual Hierarchies for Needs of the Culturally Diverse Gifted

self actualization	creative production
aesthetic needs: symmetry, order and beauty	
cognitive needs: to know, understand and explore	analysis, synthesis and evaluation
esteem needs: to achieve, be competent; gain approval and recognition	knowledge and its application
belongingness and love	
safety needs	basic skills
physiological needs	
Maslow's Hierarchy of Needs	Rimm's Hierarchy of Cognitive Needs

SECTION SEVEN: ABILITY GROUPING

America's first true attempt to implement ability grouping for gifted and talented students occurred with the Cleveland Major Works Program, established in 1921. Since that time, a number of attempts have been made to evaluate the strengths and weaknesses of this program through its comparison with non-grouping programs within the regular educational system. Sumption (1941) compared three groups of 65 children on a series of questions related to their social relationships, self-expression, critical thinking ability, health, and other activities. At the time the questionnaires were answered, the respondents ranged in age from 18-30 years. One group had not participated at any time in the Major Work Classes, a second group had received up to three years' experience in the classes, and the third group had four to twelve years' experience with the Major Work program. In comparing the results, Sumption found no important differences in physical or mental health, nor in students' attitudes toward home and family relationships. Significant differences were found, however, in the attitudes, values, and recreational habits of the Major Work Class students. These students participated in wider ranges of leisure-time activities, had wider and more extensive reading activities, demonstrated more effective ability in taking on leadership roles, and had a wider range of self-expressive activities in which they participated.

Grouping students of like ability has had an interesting history in American education. Prior to 1969, grouping or "tracking" was common. It was generally assumed that faster-learning students with higher intelligence and achievement scores should be grouped together to receive a greater breadth and depth of content. Rosenthal and Jacobson (1968) demonstrated that IQ scores may bias teachers' expectations of their students. In their research, they found that teachers expected less and received less from children labeled as "slow learners" by their intelligence scores. Publicity surrounding this study caused ability grouping to be scrapped as a viable option for gifted students (Brophy, 1982; Cooper, 1979; Davis, 1983).

A summary of the research on general ability grouping presents as many contradictions as it does generalizations. It is unfortunate that so much of this type of research has not been well-designed nor systematically carried out. A major hurdle in the comparison of programs or instructional techniques is the virtual impossibility of controlling for all potential intervening variables. These variables may range from the time of day when instruction took place, to teacher personality, to the level of lighting in the educational setting, just to mention a few. Nevertheless, the following conclusions have been established in several studies:

1. Significant academic gains result when programs are adjusted to student abilities. Grouping alone is not sufficient, however, to show differences in achievement of grouped over nongrouped gifted students. The instructional materials used in grouped situations must be appropriately differentiated for gifted learners (Gallagher, 1985; Goldberg, Passow, Justman & Hage, 1965; Goldberg, 1965; Martinson, 1972; Howell, 1965; Anderson, 1962).

2. Attitudes of gifted students, their parents, and teachers are generally favorable toward special groups or classes, especially if such grouping is flexible and not totally segregated for the entire school day (Borg, 1964; Findley & Bryan, 1971; Justman & Wrightstone, 1956; Colangelo & Kelly, 1983).

3. Positive development in self-concept and an increased sense of well-being may result from special group placement (Colangelo & Kelly, 1983; Stopper, 1979; Rogers, Smith & Coleman, 1978; Ross & Parker, 1980; Coleman & Fults, 1982 (for females only).

4. The amount of time spent in special groups or classes related positively to achievement gains of gifted students (Friedman, Raymond & Feldhusen, 1978; Goldberg, 1965; West, 1960; Simpson & Martinson, 1961; Findley & Bryan, 1971).

5. Attitudes of other parents and teachers are reported as more negative toward grouped learners (Clark, 1983; Anderson, 1960; Goldberg, Passow & Justman, 1966).

6. There is more opportunity for individual expression, in-depth study, fast-paced presentation, and freedom from regimentation in ability-grouped classes when conducted by specially trained teachers (Goldberg, Passow & Justman, 1966; Delisle, Reis & Gubbins, 1981; Sumption, 1941).

7. There are more high achievers and fewer underachievers reported in ability-grouped classes. Underachievers present in high ability grouping options, however, are significantly more likely to experience increases in academic self-concept (King, 1981; Reynolds & Bradley, 1982; Ross & Parker, 1980; Rogers, Smith & Coleman, 1978).

In a review of over 700 studies on ability grouping, Kulik & Kulik (1979) noted mixed results on the advantages of ability grouping the the achievement of learning outcomes. The major finding of the Kulik & Kulik meta-analysis was that grouping was most beneficial for gifted students and provides little or no benefit for average or slower learners.

With the resurgence of interest in gifted and talented programming in the mid to late 1970's, some forms of ability grouping have become acceptable once again. Robinson, Davis, Fiedler & Helman (1982) have defined grouping as "providing various organizational structures of either long or short duration whereby students of like ability can work together." According to Davis & Rimm (1985), these grouping options may be categorized as either (1) full-time homogeneous classes, (2) full-time heterogeneous classes, or (3) part-time/temporary groups.

Full-Time Homogeneous Grouping

Magnet Schools

Cox and Daniel (1983) reported that "magnet schools" are substantially increasing as an option for gifted and talented students in many large cities, such as Boston, Cincinnati, Houston, Winston-Salem, Milwaukee, St. Louis, and Minneapolis-St. Paul. The magnet school provides a specialized curriculum planned for students of all ability levels but with specific interest areas, such as the sciences or the arts. Students identified as high in the targeted interest area are then bused from all over the school district in which the magnet school is located to attend the high school that will suit their educational and career interest. Davis & Rimm (1985) concluded that such programs have been found to meet students' needs and are known to reduce the dropout rate for gifted and talented students. Gallagher (1985) suggested that the use of magnet schools represents a particular program option chosen voluntarily by parents and students rather than a mandated change or imposed student separation by school administrators.

Special Schools for the Gifted

Under this grouping option, an entire elementary or secondary public school is designated for gifted and talented students. The curriculum will include both the traditional academic content (based on state and district requirements) and special enriched and accelerated training in the content area(s) the school emphasizes. David & Rimm (1985) concluded that this option is most typically found in larger cities. Contrary to what might be expected, such special schools have not been found to foster elitism, nor to be discriminatory to students from culturally diverse or disadvantaged backgrounds (Cox & Daniel, 1983). It is highly unlikely that taxpayers would be willing to foot the bill for such a program if such were to be the case! Pfeil (1978) described one highly successful example of an elementary level special school with separate programs within it for all five federally recognized domains of giftedness in Milwaukee. Cox & Daniel (1983) described the School for Creative and Performing Arts in Cincinnati, which serves grades 4-12 and includes the visually impaired and learning disabled who have exhibited special gifts in the creative and performing arts areas. The majority of special schools, however, are established at the secondary level. Notable examples in the arts would include the Alabama School of Fine Arts (Juntune, 1981), the Houston School for the Performing and Visual Arts (Cox & Daniel, 1983), the Walnut Hills High School College Preparatory in Cincinnati, and the North Carolina School of the Arts in Winston-Salem (Cox & Daniel, 1983). The North Carolina School of Science and Mathematics and the Bronx High School of Science are just two examples of special public schools for the gifted which deal with specific academic gifts (Cox & Daniel, 1983).

Private Schools for the Gifted

Some private schools admit only gifted and talented students. The Roeper School for the Gifted in Michigan, and the Nueva Learning Center in Hillsborough, California, are two examples of such schools which require high level admissions test scores in order to enter the school and expect high level achievement from all students who attend. In recent years, Coleman (1981) has received considerable publicity for his research-based conclusion that achievement is significantly higher in private schools, regardless of their label as a gifted or regular private school. It can be explained, however, that the majority of students who attend private schools are economically advantaged, and thus the expectation would be for higher achievement. Stanley (1982) has also concluded, however, that private schools may be the only avenue for an accelerated education for gifted students.

School-Within-A-School

In this organizational pattern, gifted and talented students from within a district attend a particular school which also accommodates "regular" students. For part of the day, the gifted attend special classes taught by special teachers. Then they mix with the rest of the students for nonacademic subjects, such as physical education, art, home economics, and for social events. Clark (1983) concluded that such an option allows gifted students to learn to appreciate other students for their abilities and is especially appropriate for the mildly and moderately gifted, rather than the highly gifted.

Special Classes

Typically, this option places all gifted students at one grade level into a separate class with their own specially trained teacher at the elementary level. Secondary students are more typically channeled into college preparatory classes which challenges outstanding abilities in chemistry, physics, calculus, etc. Very often these classes are titled "advanced" or "accelerated." Clark (1983) argued that while such classes meet the needs of the highly gifted in interacting with others like themselves, these classes may cause students to feel some resentment or social discomfort with their special status. Gallagher (1985) and Cox & Daniel (1983) also described "Advanced Placement" and "International Baccalaureate" programs as special cases of such grouping options. In these cases, gifted students are provided with the separate grouping simultaneously with an acceleration of content in the subject for which they are grouped. These latter two options have been extraordinarily successful in meeting the cognitive needs of gifted and talented high school students, in part because of the relatively inflexible and prescribed structure of both programs (Cox & Daniel, 1983).

FULL-TIME HETEROGENEOUS GROUPING

Multi-Age Classrooms

Multi-age classrooms consist of the combining of grades within a school. At various times in the past ten to fifteen years, this option has been called "Individually Guided Education" (Klausmeier & Goodwin, 1975), "Continuous Progress" (Cox & Daniel, 1983), "Adaptive Learning" (Wang, 1980), or "Nongraded Education" (Hunter, 1974; Goodlad, 1981). Under any of these labels, the basic procedure is to permit capable students to accelerate through the regular curriculum at an individualized pace, skipping content already mastered. Elman & Elman (1983) concluded that such an option easily permitted groups of gifted students to tackle more advanced material at a significantly earlier age with consistent success in achievement of and retention of learning outcomes. Stanley (1980) argued that the need for accelerated programs such as the SMPY program at Johns Hopkins would be rendered unnecessary if multi-age classrooms were established to span kindergarten through the 12th grade. He stated, "...Age grading for instruction in academic school subjects has crept insidiously upon us as we have moved from tutorial instruction and the one-room schoolhouse to the current situation. It needs to be reversed." (11). Cox & Daniel (1982) described a variety of multi-age classrooms that have demonstrated success at all grade levels, including the Chesapeake Demonstration School, the University of Pittsburgh Laboratory School (ALEM Model), the University of California at Los Angeles Elementary School, and the Plano Independent School District in Texas.

Cluster Groups

In general, "cluster grouping" may be defined as the placement of gifted and talented students together in a special class in which the remainder of the class is composed of average and below average students. The number clustered together usually ranges between 5 and 10 students (Davis & Rimm, 1985). Under such an option, the teacher is provided with specialized training in how to deal with the gifted cluster and is provided preparation time in order to develop differentiated learning experiences for the group. Juntune (1981) described notable examples of the cluster group plan at both elementary and secondary levels in Marion, Massachusetts, and Lawrence, Kansas. At present, very little published research exists on the success of this program option. Kaplan (1974) itemized a number of "necessities" for a cluster group without which the chances for significant increase in achievement will be minimal:

1. Development of criteria for the selection of students

2. Definition of the qualifications for and the selection process for the cluster teacher
3. Clarification of teachers' responsibilities and activities
4. Plan for the differentiation of cluster learning experiences
5. Plan for support services and special resources needed for differentiation.

Mainstreaming

Treffinger (1981) called this option the typical "default" plan when a school or district has no formal gifted program. Under this option, the student spends the majority of the school day in the regular classroom. Whitmore (1980) concluded that it is likely that future research will prove that the regular classroom is the most restrictive environment for the gifted child unless there will be a guarantee that all classroom teachers will be helped to become more able to effectively individualize instruction. Juntune (1981) described a few school districts, such as the Palo Alto School System in California, which have deliberately elected to mainstream their gifted students rather than to create special classes or pullout programs. As both Juntune and Treffinger (1982) have found, however, such an option is most successful when an Individualized Educational Plan (IEP) is used to structure the independent work, the compaction of curriculum and the accelerated or enriched opportunities to be offered to each mainstreamed student, in much the same manner that the IEP is used to plan the education of retarded, learning disabled, and handicapped students. Davis & Rimm (1985) listed some representative examples of mainstreaming options that may provide better instruction for the gifted and talented student in the regular classroom:

1. using pretests or mastery tests to permit students to "test out" of material they already know
2. using individualized learning packets, programmed learning, learning modules, learning centers, and minicourses to master basic skills
3. allowing uninterrupted time each day for individual and small-group projects
4. incorporating creative thinking techniques in every subject area
5. helping students to develop higher-level processes in the planning of independent projects
6. bringing in guest speakers to describe their careers or unusual hobbies
7. helping student to understand their own strengths, interests, learning styles and preferences and to become sensitive to those of others
8. exploring many points of view about contemporary topics, with special emphasis on the analysis and evaluation of conflicting ideas and opinions
9. helping students to set personal and academic goals.

Gallagher (1985) has cautioned, however, that too often a mainstreaming program can become a camouflage for offering no program at all.

PART-TIME/TEMPORARY GROUPING

Pullout Programs

With minor variations, gifted elementary (and sometimes secondary) students are removed from their regular classes two to three hours per week to participate in special enrichment activities guided by a gifted teacher or district teacher/coordinator. The usual meeting place is a "resource room" in which provisions are made for special reading material and equipment. Pullout activities usually focus on creative development, higher thinking skills, personal development, values clarification, and independent study projects. Many researchers have voiced opposition to this programming option, citing such reasons as (1) teachers become easily saddled with the dilemma of permitting students to miss important content or else forcing them to make up the missed work (Reis, 1983); (2) the expense of an additional teacher and specialized materials (Elman & Elman, 1983); (3) lack of effectiveness because students are involved for only a fraction of the school week (Elman & Elman, 1983); (4) resentment by classroom teachers that pullout is a reflection on their inability to provide adequate instruction in the classroom (Davis & Rimm, 1985); (5) detrimental effects to student social relationships (Elman & Elman, 1983); and, (6) too much "fun and games" with too little valuable, theory-based training (Renzulli & Smith, 1978). Other researchers have found that the pullout program can be highly successful in providing needed social interaction among true peers (Davis & Rimm, 1985) and in developing differentiated, enriched training for gifted students (Juntune, 1981). In the Richardson Study, conducted by Cox & Daniel (1984), the pullout program model was found to be at least a part, if not the entire, gifted option in seventy percent of the districts studied. Cox & Daniel (1984) concluded that the pullout model is most effective when it supplants or supplements what is happening in the regular classroom curriculum. Secondarily, the pullout curriculum should allow learners to enjoy appropriate learning experiences in every subject area. Interestingly, these researchers have found that the part-time class generally costs more then a full-time one. Full-time classes usually only require a reassignment of teachers, but not additional teachers. Despite this fact, administrators appear to find the pullout model manageable and preferable. Dox & Daniel (1984) have questioned whether this might have resulted because the model is the only approach with which most administrators are familiar.

Resource Programs and Resource Rooms

This term has been used rather freely. Kaplan (1974) defined it as a room with special resources that "...provide a learning environment specifically tailored to the needs and objectives for educating the gifted and talented." (6.2) Since pullout students are often sent to a "resource room," pullout programs are sometimes called "resource programs" or "resource room programs." Kaplan (1974) noted that a resource room may be used (1) for the development and dissemination of materials for teachers and students in other settings, and (2) as a center for teacher inservice and parent education. Juntune (1981) described several successful resource programs developed according to Kaplan's definitions, including South Windsor, Connecticut, and Ankeny, Iowa.

Part-Time Special Classes

The Special classes discussed under "Full-Time Homogeneous Grouping" may also be developed as part-time options. Davis & Rimm (1985) described three successful part-time special classes in Seattle, Washington, the Wheaton-Warrenville District Talented and Gifted program, and the Chelmsford High School Comprehensive Law program in Chelmsford, Massachusetts.

Special Interest Groups and Clubs

Also known as extracurricular or co-curricular activities, most secondary schools make these available to all students. It is clear, however, that the G/T conscious teacher can assume leadership for organizing these enriching activities for interested students. Colangelo & Kelly (1983) have even argued that the gifted program *per se* might be considered as just one more extracurricular activity by gifted secondary students and their parents, thus becoming more acceptable socially for both gifted students and their nongifted peers.

Super Saturday or Summer Institute Programs

Of increasing popularity are enrichment classes or activities which meet outside of school time, either on Saturdays or during the summer months. Cox & Daniel (1984) were quick to point out, however, that such options have been around for a long time. Included in this category would be the National Music Camp summer program at Interlochen, Michigan, the National High School Institute at Northwestern University and at Duke, the International Language Camp program at Moorhead, Minnesota, and Governor's Schools in Arkansas, North Carolina, South Carolina, and Virginia. Perhaps the most successful Saturday program has been developed by Feldhusen (1981) at Purdue University.

In 1983 Gallagher, Weiss, Oglesby and Thomas reported a national survey of 1200 teachers, administrators, and parents on their choice for a desirable strategy for a differentiated program for gifted students at both the elementary and secondary levels. There were no major differences of opinion among the three groups; hence, their preferences have been combined in summary form in Table Twelve below:

Table Twelve. Preferred administrative strategies for educating the gifted.

Strategy	1	10	20	30	40	50
Enrichment classroom						
Consultant teacher						
Resource room/pull-out						
Community mentor						
Independent study						
Special class						
Special schools						

___ Elementary preference

___ Secondary preference

At the elementary level the resource room/pullout program was the most popular. Gallagher, et al. (1983) suggested that this finding may reflect the desire to have the gifted experience both special learning experiences with gifted peers yet also experience a part of the school day with students from all backgrounds and abilities. Preferences shifted drastically at the secondary level, with the most popular choice being the special class. To understand this preference, Gallagher suggested that the gap in ability has widened so greatly by high school that the idea of instructional grouping seems much more practical than trying to handle such gaps in a regular classroom setting.

In terms of cost, several research studies have concluded that special programs for the gifted student cost substantially less than other programs for exceptional students (Rossmiller, Hale & Frohreich, 1970; Gallagher, Weiss, Oglesby & Thomas, 1983). Gallagher, et al., found that the median cost for the resource room was thirty percent over the regular cost of educating an average student in the regular classroom. The special class was about twenty-seven percent higher, while the teacher consultant model was only sixteen percent. These were modest costs, argued the researchers, when one considered that special programs for the educationally retarded or learning disabled spend well over one hundred percent in excess of the costs of the average student, and programs for the multiple handicapped or blind may run three to five hundred percent above regular costs. Despite the relatively low costs of gifted programs, the states have varied widely in their willingness to provide financial help to local school systems for program support. Mitchell (1981) reported that about $150 million was committed with over 900,000 gifted students receiving some kind of special service in 1981. Thirty- seven states have at least one full-time person in the state department charged with at least encouraging appropriate programs for the state's gifted and talented students (Cox & Daniel, 1984).

In summary, a study (Tremaine, 1979) which compared the attitudes, accomplishments, and achievements of gifted high school students participating in gifted programs involving some type of grouping, with gifted high school students who did not participate found no validation for the contention that gifted programs may result in snobbery, indifference, conceit, or any other negative qualities. In fact, the participating, ability-grouped gifted students in this study:

1. earned higher grade point averages
2. took more advanced classes
3. scored higher in the SAT tests
4. won significantly more scholarships and awards
5. planned to attend a four-year college in far greater numbers
6. expressed more positive attitudes toward school after graduation
7. were involved and spent more time in school activities
8. evaluated their teachers more highly
9. enjoyed as many friends

Such findings most certainly indicate that gifted programs can make significant positive differences and are well worth the effort it takes to develop and implement them.

SECTION EIGHT: ACCELERATION

Probably the most time-honored program adaptation has been to move the gifted student through the educational system faster - a procedure called acceleration. This technique is used primarily to shorten the time that a gifted student is in an educational setting. The basic purpose of this strategy has been to allow the gifted to get launched in their chosen professions earlier and thereby, be given additional chances to make unique contributions to their chosen fields. Lehman (1953), for one example, has shown that for some fields of endeavor, particularly the physical sciences and mathematics, greatest productivity occurs between ages twenty and thirty.

In general, there has been a rare consistency in the research literature concerning the advantages of acceleration. Terman & Oden (1947) pointed to acceleration as one of the major factors influencing the "success" of the 150 "most successful" men in their longitudinal study. Reynolds, Birch & Tuseth (1962), in an extensive review of acceleration research on early admittance programs, concluded that there was clear and universally favorable evidence that early admission of mentally advanced children was to their advantage. Other findings can be summarized as follows:

1. Gifted students are inclined to select older companions (Bish & Fliegler, 1959; Terman & Oden, 1947).

2. Acceleration can be used in any school (Fund for the Advancement of Education, 1957; Braga, 1969).

3. There is less boredom and dissatisfaction among the accelerants, and social and emotional adjustments are generally high (Lucito, 1964; Stark & Stanley, 1978; Morgan, Tennant & Gold, 1980).

4. To be successful, acceleration must be continuous and coordinated (Alexander & Skinner, 1980; Gallagher, 1966; Morgan, Tennant & Gold, 1980).

Eisenberg & George (1979) studied forty-nine college students who had entered college early, finding that the early entrants performed as well or better than their college classmates. There was no evidence of social or emotional maladjustment. The concern about social stress issues and acceleration has been studies by Weiss (1978). In his research with 123 college professors who had been accelerated through grade-skipping, forty percent of the group noted that there had been social anxieties or problems, especially during adolescence. Such stress was rarely considered serious, however. Gallagher (1985) suggested that the underlying reasons for strong opposition to acceleration in most school systems may lie not so much in actual research data, but in the hidden anxieties or concerns of parents and teachers about the potential "premature thrusting" of the child out of the parental nest into life.

The work of Julian Stanley of Johns Hopkins University (Nevin, 1977) has validated the importance of acceleration as a feasible and viable option for gifted students. Since 1971, Stanley has provided gifted mathematics students an opportunity to develop their ability at an accelerated pace. Over the past fourteen years, Stanley's "Study of Mathematically Precocious Youth" (SMPY) has developed a wide variety of educational opportunities in several areas of radical acceleration, from fast-paced accelerated high school math sequences for junior high students, to individualized college study. Stanley & Durden (1980) also introduced a program for accelerated language arts in 1978, and in 1979, added a tutorial language and mathematics program based on diagnostic testing, followed by prescriptive instruction in math and verbal ability.

In a recent attempt to synthesize all the available research on the effects of acceleration on gifted performance, Kulik & Kulik (1984; 1983) found 26 studies comparing accelerated gifted groups with comparison groups of equivalent ability. The researchers concluded that (1) gifted students who were accelerated into higher grades performed as well as the gifted older students already in those grades, and (2) the gifted accelerants showed almost a year's advancement over gifted same-age nonaccelerates.

Table Thirteen shows the various methods of acceleration for gifted students open to the teacher and school administrator at most levels of the educational system.

Table Thirteen: Methods for the Acceleration of Gifted Students

GRADE LEVEL	TYPE OF ACCELERATION
Primary (1-3)	1. Early admittance to school 2. Nongraded primary 3. Subject-skipping
Intermediate (4-6)	1. Nongraded intermediate 2. Grade-skipping 3. Subject-skipping
Junior High (7-9)	1. Three years in two (telescoped) 2. Senior high classes for credit 3. Grade-skipping
Senior High (10-12)	1. Extra load 2. Four years in three (telescoped) 3. Advanced Placement, credit by exam 4. Concurrent enrollment in college 5. Early admission to college 6. Correspondence courses 7. Mentorship

ACCELERATION STRATEGIES

Early Admission to Kindergarten or First Grade

Early admission is an easily administered and highly successful acceleration strategy, well-supported by research, which has consistently favored it (Birch, 1954; Cutts and Mosely, 1957; Hobson, 1948; Reynolds, Birch & Tuseth, 1976). The Birch (1954) research, as one example, studied 29 girls and 12 boys who had been admitted early to first grade. When these children were compared with their first-grade counterparts, there were significant, positive differences in their IQ scores, their reading readiness, their social and emotional maturity, good health, and in their height and weight. Davis & Rimm (1985) concluded that each student being considered for early admission must be individually evaluated on the following criteria:

1. intellectual precocity (IQ 130)
2. eye-hand coordination (at least average perceptual-motor skills)
3. reading readiness (above average)
4. social and emotional maturity (determined by a psychologist who has observed the child in a preschool environment)
5. health (above average, good)
6. sex (females, in particular, are to be favored for this strategy)
7. school of entrance (IQ average of school - if it is high, then acceleration is not so important)
8. family values (family must be supportive of education and academic achievement)

Grade-Skipping

Perhaps the most traditional method of accelerating gifted elementary students, grade-skipping requires no special materials, facilities, or programs. Davis & Rimm (1985) identified two major concerns regarding grade-skipping. First, there may be a problem with missing critical basic skills. As a precaution, it is recommended that diagnostic tests for the grade to be skipped be administered so that missing skills may be identified and prescriptively taught. The second problem concerns potential social adjustment problems with new peers. Although there has been much opinion voiced on this issue, the research seems to be fairly consistent that in most cases gifted students are quite comfortable with their "intellectual" peers and suffer no noticeable maladjustment or neuroses (for example, Daurio, 1979; Fox, 1979; Reynolds, 1960; Stanley, 1979; Witty, 1965). Terman & Oden (1947) found that students with IQ's over 135 who had been accelerated one to two years made better adjustments than gifted students who were not accelerated. Cohn (1980) observed that accelerated students most often determine their own adjustment and that acceleration is not a major consideration in that adjustment: "...people who have little or no social life (in college) at age 16 or 17 would probably have the same problems if they were older...Some people adjust, but some don't." (27)

Hollingsworth's (1942) study of children with IQ's over 180 underscores another important point about the acceleration issue. She concluded that children with very high levels of intelligence often do find social adjustment a difficult task. Since these children are often the ones most likely to be skipping grades, it may be a mistaken assumption to relate social maladjustment to acceleration rather than to their extremely high intelligence level.

Furthermore, several researchers have found that the boredom, restlessness, frustration, and disruptive behaviors are almost immediately replaced by enhanced motivation, improved self-concept and improved study habits and productivity when grade-skipping has occurred (Bartkovich & Mezynski, 1981; Hall, 1982; Karnes & Chauvin, 1982; Tobin, 1979).

To reduce the risk of problems related to grade-skipping, Davis & Rimm (1985) have formulated the following guidelines:

1. To skip an entire grade, a child should have an individually tested IQ score of 135 or more.
2. Regardless of ability, only one grade should be skipped at a time. After several years for adjustment, there may be reason to consider skipping another grade.
3. Diagnosis of skill gaps must be undertaken so that the student may be assisted in acquiring any missing basic skills.
4. A supportive teacher, counselor, and/or group of gifted peers should be available to help the accelerant with any social problems related to skipping.
5. An appraisal of the student's present intellectual and social adjustment should be considered in the decision-making process. If a child is not making good social adjustment in the present grade, it cannot be assumed that this adjustment will be improved by skipping. Likewise, continued poor adjustment in the higher grade should not always be attributed to grade-skipping.
6. Every grade-skipping decision needs to be made separately. Physical maturity, height, general emotional stability, motivation, and ability to handle challenge must be considered, in addition to the demonstrated need for intellectual stimulation.

Subject-Skipping

This strategy usually involves taking classes or studying particular subjects with students in higher grades. It is especially appropriate in sequential content areas, such as reading, mathematics, or languages. This type of skipping is useful in both elementary and secondary levels. Davis & Rimm (1985) concluded that subject-skipping has the advantages of providing intellectual challenge in a specific area of strength while the student is allowed to continue to develop appropriate grade-level skills in other areas not so strong. It further permits the student to remain with chronologically similar peers. The major disadvantage, found by Davis & Rimm (1985), is the frequent lack of continuity from grade to grade. Too often a particular teacher will provide for subject-skipping but makes no overall organizational plan for continuous progress, such that the child is forced to repeat information already learned when he/she leaves that classroom.

Early Admission to Junior or Senior High School

Although this particular acceleration alternative is not very popular (Davis & Rimm, 1985), for some students, it is best implemented when the grade to be skipped is the one just before junior or senior high school, i.e., grade five or six, or grade eight or nine. From an academic perspective, the readiness may be there for advanced work in the specialized or departmentalized secondary school, while at the same time, matriculation into the junior and senior high levels usually is a time for development of new friendships anyway, as students from several junior or senior high schools meet for the first time in this new level.

Credit by Examination

Under this option, students are allowed to "test out" of a course, and if mastery is demonstrated, are given academic credit for completion of the course. Davis & Rimm (1985) have concluded that such options are not only cost-free, but help to prevent boredom, repetition, and encourage self-direction in gifted students. This type of option is most often experienced at the secondary level, such that college credit is awarded on the basis of performance on an examination, such as the Advanced Placement Program (AP) or the College Level Examination Program (CLEP: Karnes & Chauvin, 1982). The former, described in the previous section, involves the grouping of gifted students who take high level courses in order to prepare for the Advanced Placement examination. According to Cox (1983), in May, 1981, 133,702 students from 5,252 secondary schools took College Board AP exams. Connecticut, Maryland, and Massachusetts have the highest percentages of schools participating in the Advanced Placement program. It is estimated by Cox that approximately 25 percent of the secondary schools in the United States are currently offering at least one or more AP classes. Casserly (1969) reported that students rate several advantages to participation in AP classes, including: (1) chance to study with others of similar interest and abilities; (2) the AP teachers are highly skilled and trained in a content area; and, (3) AP teachers are highly dedicated and demonstrate a willingness to devote time outside of school to the students' needs. In the CLEP program, only examinations are offered. Most of the exams are 90-minute multiple choice tests, and a person is limited to four of these tests in one day. At the present time, not all colleges will accept CLEP, but most do accept AP examination scores and award credit.

College Courses in High School

Several approaches have been offered for giving students the opportunity to take college courses while still in high school. Dual enrollment programs, in which a student may be excused from high school for part of the day to take one or more courses on a college campus, is one such program. The earned college credits are then subsequently used at that particular college to place the student in advanced level classes when he/she is actually admitted. Other times, a college will send a faculty member to the high school to teach a course for college credit, for which the student will receive both high school and college credit, but must pay the college tuition.

Correspondence Courses

Almost every major university or college offers correspondence courses at the freshman and sophomore levels to be taken for college credit. Davis & Rimm (1985) concluded that correspondence courses are particularly valuable for gifted students living in a rural area or in a small town or city. To be most effective, it is helpful to designate a high school faculty member to serve as an advisor for the student working on such a course to help provide support, motivation, as well as interpretation of course materials and problems.

Telescoped Programs

This strategy collapses three academic years' work into two, or four years of high school into three. At the high school level, most often this program is a counseling problem, through which the counselor helps the energetic and capable student cut down upon the "study hall" classes and schedules the four years' worth of high school requirements into a more compact and busier three.

Early Admission to College

Also known as "early high school graduation," this plan often allows gifted high school students to enter college early on a full-time basis through the waiving of some high school requirements. Although this has been done fairly extensively (Kaplan, 1974; Fox, 1983; Karnes & Chauvin, 1982), it is not greeted with wild enthusiasm by many college admissions offices! Cohn (1980) concluded that the strategy is particularly useful for students who feel thay have outgrown high school socially and emotionally, as well as for those who are academically bored. The major disadvantage, according to Davis & Rimm (1985) may be that the early graduate is forced to forego opportunities for scholarships and honors in exchange for the challenge of early college entrance.

Mentorship

The typical mentorship includes an extended relationship between a community professional and a single student over a period of months. Very often mentorships are used as a form of career education for gifted secondary students. In its usual form, the student visits the mentor at the job site on a scheduled basis to learn first-hand and in detail the activities, responsibilities, problems, worries, and life style associated with that particular business, art, or profession. Cox & Daniel (1983) noted the commitment required on both the part of the student and mentor. Several researchers have concluded that mentorships have the capacity to transform a learner's potential into reality in addition to providing interaction between "true" peers (for example, DeMott, 1981; Boston, 1976). Cox & Daniel (1983) detailed guidelines for planning and implementing a mentorship with a high degree of success. Their recommendations included:

1. use of a coordinator who has access to the decision-maker/administrator
2. specification of the purpose of the mentorship and the role of the student
3. preparation of written criteria for student selection based on multiple indices, rather than a single index
4. development of a clear, defensible academic credit policy, relating the work experience directly to the course for which the credit will be received
5. careful match of the mentor to student with special concern that mentors are creative producers who will not treat the student as a "go-fer"
6. preparation of students with related course work and reading prior to the mentorship experience
7. help in development of students' individual goals for their mentorship

8. mentor help in the evaluation of the student's work

9. a meeting of the academic needs of the student first. Students should be assigned required reading; they also should keep journals in which they analyze their activities and experiences

No matter what type of acceleration strategy is selected, it goes without question that caution needs to be exercised in selecting candidates for acceleration. It would be foolhardy to disregard a student's physical and emotional development in moving him/her ahead through school beyond age or grade level expectations.

Justman (1954) concluded that where possible, it is probably better to move whole groups of youngsters through at an accelerated pace than it is to move a single student. But in the small school, where there are few exceptionally able children and where curricular adjustments within broad range classes are difficult to achieve, acceleration can raise the level of challenge and stimulation for the gifted student.

SECTION NINE: ENRICHMENT

Enrichment can be defined as the addition of disciplines or areas of learning not normally found in the regular curriculum. Such an option may be used at both the elementary and secondary levels to help meet the educational needs of gifted and talented students. Although enrichment is feasible at any time within any organizational model, it is generally used in the traditional classroom to meet the needs of the advanced learners without having to separate them from the typical learners at a specific grade level.

Many well-known researchers in the field of gifted education have attempted to organize the "idea" of enrichment or differentiation of the curriculum. Gallagher (1985) defined enrichment as the development of particular intellectual skills and talents of the gifted student. Appropriate intellectual skills to be developed might include:

1. ability to associate and interrelate concepts
2. ability to evaluate facts and arguments critically
3. ability to create new ideas and originate new lines of thought
4. ability to reason through complex problems
5. ability to understand other situations, other times, and other people, to become less bound by one's own peculiar environmental surroundings.

It was Gallagher's argument that such skills may be taught by modifying the breadth, conceptual level, and tempo of curriculum content. Maker (1982) argued, however, that modification must take place in four curriculum areas: content, process, product and learning environment. Table Fourteen presents a summary of the modification techniques which may be used within each of the four modification areas to enrich or differentiate classroom curriculum.

Table Fourteen: Maker's Modification Techniques For Enriching Curriculum

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Modifications of Content

1. Abstraction
2. Complexity
3. Variety
4. Organization
5. Economy
6. Study of people
7. Methods of inquiry

Table Fourteen: Maker's Modification Techniques For Enriching Curriculum (continued)

Modifications of Process

1. Higher levels of thinking
2. Open-endedness
3. Discovery
4. Proof and reasoning
5. Freedom of choice
6. Group interaction
7. Pacing
8. Variety

Modifications of Product

1. Real problems
2. Real audiences
3. Evaluation
4. Transformations

Modifications of Learning Environment

1. Independence-encouraging
2. Open
3. Accepting
4. Complex
5. Student-centered
6. High mobility

According to Sato & Johnson (1978), enrichment or differentiation must include the following:

1. high content complexity, permitting student control over the direction and rate of learning and requiring higher level thinking skills

2. content beyond the prescribed curriculum, emphasizing interconnectedness with new disciplines

3. student-selected content, whereby student interest and needs help to determine what will be learned

4. abstract ideas, theories and concepts, requiring reflective, creative, and critical thinking

5. non-grade level resources, i.e., materials, equipment, and information beyond the designated grade level

In a similar vein, Kaplan (1974) produced a list of what enrichment is and does:

1. extends or replaces traditional learning experiences
2. is productive rather than reproductive thinking
3. is complex thinking, not just harder work
4. is learning of concepts and generalizations rather than facts
5. is based on applications of learning
6. is associating and interrelating learning with other areas
7. is based on student need and readiness, not grade level appropriateness
8. is learning to seek problems, not answer teacher-posed questions
9. is learning to critically evaluate
10. is learning things as they should be or as they could be, not learning things only as they are

In order for these types of learning to take place, Kaplan (1974) suggested a three-pronged enrichment structure. According to Kaplan, enrichment is provided through (1) exposure, (2) extension, or (3) concept development learning experiences. Maker (1983) concluded that there are ten teaching models appropriate for providing enrichment for gifted students. Table Fifteen displays these models as they may be categorized using the Kaplan enrichment structure.

Table Fifteen: Ten Teaching Models Appropriate For Providing Enrichment

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Exposure Models (Introductory experiences, materials, and information not generally connected to the regular curriculum.)

1. Parnes Creative Problem Solving Model
2. Guilford Structure of the Intellect Model
3. Taylor Multiple Talent Totem Pole Model

Extension Models (Elaboration of regular curriculum through additional allocations of time, materials, experiences, or related independent study.)

1. Treffinger Self-Direction Model
2. Bloom Taxonomy of Cognitive Objectives Model
3. Kohlberg Stages of Moral Reasoning Model
4. Williams Cognitive-Affective Interaction Model

Table Fifteen: Ten Teaching Models Appropriate For Providing Enrichment

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Concept Development Models (Focus on thorough or new explanations of concept or skill, of which only part is taught in regular curriculum.)

1. Taba Teaching Strategies Model
2. Bruner Structure of the Discipline Model
3. Renzulli Enrichment Triad Model

Davis & Rimm (1985) specified a number of strategies for two forms of enrichment: training in creative thinking and training in affective development. These enrichment strategies included:

1. independent study and independent projects
2. learning centers
3. field trips
4. Saturday programs
5. summer programs
6. mentors and mentorships

Additionally, Davis & Rimm (1985) have enumerated a number of activities which build development in creativity and the affective domain. In the area of creative thinking development, these activities include:

1. Future Problem-Solving program (Crabbe, 1982)
2. Odyssey of the Mind program (Gourley, 1981)
3. Creative Problem-Solving process (Parnes, Noller & Biondi, 1977)
4. Creative dramatics (Davis, Helfert & Shapiro, 1973)
5. Brainstorming (Osborn, 1963)
6. Idea Evaluation (Davis & Rimm, 1985)
7. Attribute Listing, Modifying, Transferring (Crawford, 1978)
8. Morphological synthesis (Allen, 1962)
9. Idea Checklists (Davis, 1973)
10. Synectics Methods (Gordon, 1961; Gordon & Poze, 1980)

11. Direct, Personal, Fantasy Analogy (Gordon, 1974)

12. Implementation Charting (Davis & Rimm, 1985)

Techniques or activities listed by Davis & Rimm to develop the affective include:

1. Moral dilemma discussion (Kohlberg, 1974)
2. "Service" curriculum (Fantini, 1981)
3. Values Clarification activities (Simon, Howe & Kirschenbaum, 1972)
4. Magic Circle (Lefkowitz, 1975)
5. "Good Person Book" (Davis, 1984)
6. Guided Imagery, mental visualization (Davis, 1984)
7. Philosophy for Children program (Lipman, 1976)
8. Leadership training (Magoon, 1980)

In general, the research on the effectiveness of enrichment in meeting the needs of the gifted has been mixed. As discussed previously, it is difficult to control all the variables present in the educational setting in order to ascertain cause-effect relationships between treatment and subject.

Bennett, Rosenzweig & Diamond (1969) have concluded that an enriched environment may be at least partially responsible for increased brain size and intelligence in rats. Although we cannot make direct connections with these findings and the human developmental process, we may conservatively say that enrichment is a necessary but perhaps not sufficient condition for cognitive development.

As part of a comprehensive state plan in California, several attempts were made to evaluate the influence of enrichment programs on the academic and educational adjustment of gifted students within the regular classroom (Martinson, 1961). Two classes were evaluated at the intermediate level and one at the first grade level. In comparison with control groups, the enriched program students in all three classes showed slight gains in achievement over comparable students. One of the problems mentioned by the teachers participating in the project was the difficulty of providing the stimulation with such wide ability ranges within the classroom. The pressure of time and multiple obligations were also mentioned frequently. These same problems were also brought up by the consultants who worked with the enrichment program.

Gallagher, Greenman, Karnes and King (1960) reported an attempt to provide classroom enrichment for children of very high intellectual ability (IQ's over 150) within the framework of the regular elementary classroom in two midwestern school systems. A case study was executed on each of the 54 children in the study. Extensive tests, parent interviews, teacher interviews, and measures of social and emotional adjustment were all used to determine individual problem areas and possible ways in which the school could deal with these problem areas. The researchers found little difference between the "before and after" expected achievement scores for either the total group or for those special children for whom academic recommendations were made.

However, the teacher and parents both observed increased motivation and interest in the children who were included in the study. A limited amount of available time and the lack of subject knowledge on the part of the classroom teachers were cited as some reasons for lack of academic improvement. The investigators concluded that knowledge of a child's problems and intellectual potential must be supplemented by teacher know-how and mastery of content, and auxiliary personnel who can help the teacher use this knowledge to greatest advantage.

Traditionally, there has been controversy regarding the merits of acceleration versus enrichment (Daurio, 1979; Passow, 1981). Acceleration advocate Julian Stanley (1976), has argued that most of the supplemental educational procedures called "enrichment" may be potentially dangerous if not accompanied or followed by acceleration in subject matter and/or grade. Speaking for the opposition, Frost (1981) pointed out that enrichment implies a supplementation of the depth, breath, or intensity of content and process appropriate to the student's needs and abilities, and is the prevailing practice because of the diversity it possesses for meeting student needs. Fox (1979) and Treffinger (1981) have argued, however, that both enrichment and acceleration are necessary. This combination would result in a well-rounded, coherent program which permits students to work at their own rapid pace, as well as providing them with opportunities for ever greater variety in content, greater depth, and the development of affective, creative, scientific and other high level skills.

SECTION TEN: EVALUATION OF PROGRAMS FOR THE GIFTED

Listed below are some of the major problems found in the usual comparative research study in the literature on evaluation of gifted programs.

1. It is not possible to demonstrate the effectiveness of a given program by showing that the gifted children in the special group will score two, three, or four grade levels above their own chronological age on achievement tests. REASON: Gifted children in the regular program are already performing extremely well on achievement tests. There is every reason to believe that they would be well above their own chronological age level in achievement whatever the program. (Maker, 1983).

2. It is not possible to prove the effectiveness of a program for the gifted by giving achievement tests before the program begins and after it is completed. REASON: Accelerated educational growth can happen in the special program, but still the question remains as to whether these youngsters might not have done just as well, if not even better, in the regular program.

3. We cannot demonstrate the effectiveness of a program for gifted children by obtaining the opinions of people connected with the program (e.g., teachers, students, parents), unless these opinions have been supported by objective measures of some sort. REASON: Subjective evaluations or opinions have been shown in many experiments in psychology to be subject to conscious or unconscious bias. Secondly, there is the phenomenon known as the "Hawthorne Effect", in which there is a suggestion that people will react favorably to any program which is novel and evidences a greater interest in the parents and their children. Thirdly, the usual method of obtaining information about a program is the questionnaire, a dubious data collection instrument, if not well-designed. Questionnaires about programs almost invariably get positive responses partly because the people involved don't wish to respond negatively when people of good faith are trying hard to do something. It is likely that the most disgruntled of the recipients of the questionnaire will not answer it at all, such that the answers that the researcher does get back are predominantly positive and favorable. Last, the objective way to collect this type of information requires the use of a comparative control group, a group of youngsters presumably equal in important respects with the special group. It is rare that this type of research is conducted in the gifted area.

4. The benefits of a special program for gifted children will not be demonstrated by comparing these gifted children with the rest of the children at their grade level. REASON: Obviously, if one takes the brightest children in the group and puts them into an experimental group and keeps all the rest for "controls", then the achievement obtained by the special group may be due, not to the special educational program, but merely to the large difference in intelligence between the two groups to begin with.

5. It is not possible to demonstrate the benefits of a special program for gifted children by showing that children in the special group, even when matched for IQ, are superior if they have not been matched on other important factors also. REASON: Level of intelligence, obviously, is not the only characteristic closely related to achievement; for example, another important factor may be motivation. Most of the programs evaluated after the fact, that is, after the program is well in progress, will often be comparing gifted children of high motivation (for that is usually one of the reasons they were placed in the

special program in the first place) with gifted children who might be of the same intellectual ability but who have miscellaneous motivational, attitudinal, or family problems which kept them from being selected for the special group in the first place.

6. A program for gifted children cannot be adequately evaluated if measuring instruments are not adequare or appropriate to measure the unique nature of the program. REASON: The use of improper or inadequate measuring instruments could result in not giving full credit to the difference which the special program may have really brought about in the children. Most programs for gifted children put a high premium on the development of such characteristics as creativity, originality, ability to do critical thinking, and leadership. Unless the evaluation of change in the children includes measures of these characteristics, then the evaluation is inadequate (Gallagher, 1985).

Perhaps the most useful evaluation of a gifted program may be formative evaluation (Scriven, 1973). Formative evaluation is designed to collect information that will help the program improve. The climate surrounding a formative evaluation may be very different than the approach described in the earlier paragraphs of this section. Callahan, Covert, Aylesworth & Vanco (1981) described a program focused upon the stimulation of advanced thinking processes. The evaluation team identified several serious problems with the program, but instead of delivering this set of negative comments and leaving the responsibility to the local administration, this team maintained their contact and did the following:

1. Constructed and reviewed the results of a questionnaire assessing familiarity and attitude of program staff toward basic curriculum concepts.

2. Presented the program staff with some options available for planning for scope and sequence across the grades involved and then allowed the staff to select the options each grade level would offer across the program.

3. Presented an example of curriculum documentation format which would allow the major elements of each unit option adopted to be identified in a similar manner.

4. Helped the program staff develop a set of rationale goals, and organizational procedures for instruction within the program.

5. Discussed criteria for assessing objectives, resources, and activities with the staff.

In a review of current program evaluation studies, Gallagher, Weiss, Oglesby & Thomas (1983) found that:

1. Current studies on the training of creativity or productive thinking skills have not been able to establish a direct connection between training in fluency or flexibility, for example, and their transfer to other academic assignments.

2. Subjective testimony of students, parents, and teachers presents a positive feeling about independent study programs and programs to improve leadership skills.

3. Advanced placement courses that yield college credit in the content enrichment area in secondary schools have demonstrated cost-benefit advantages. In a study of ten southern states, savings in college costs came to $19 million for a one-year period of time. (Gallagher, Weiss, Oglesby & Thomas, 1983).

4. Talent searches, such as the Study for Mathematically Precocious Youth have been rapidly expanding and possess the potential for providing advanced content for gifted students. The data from these programs have shown that students are capable of mastering higher level material in mathematics in less time than previously thought. There has been no evidence that harm is caused to students who have been accelerated in this manner.

5. A few programs stressing preschool or primary school readiness have been able to report both academic and affective student gains (Gallagher, 1985).

6. Teachers can be effectively trained in models of thinking processes, such as Bloom's Taxonomy of Cognitive Objectives or Guilford's Structure of the Intellect, and will subsequently use these concepts and knowledge in their instruction of gifted students.

7. The teacher, well in-serviced and provided with adequate support services, is consistently identified as the crucial factor in a successful program.

The results of the Richardson Study, conducted by June Cox for the Richardson Foundation (Cox & Daniel, 1985) perhaps best summarize the combined findings of this review of research. Listed below is a summary of those findings.

Administration

1. Develop a written philosophy for the education of able learners that is consistent with the goals and values of the school district and community.

2. Select coordinator(s) during the early planning stages. Where possible, include the teachers who will be assigned to work with the gifted to participate in the planning as well.

3. Assess the current program for able learners. Retain or expand those elements which have served their needs.

4. Adopt flexibility pacing at all levels, allowing students to advance as they demonstrate mastery of content and skills.

Discovering Talent

1. Broaden the process for assessing student abilities.

2. Assess the abilities of all students, using the results as a basis for appropriate programming decisions.

3. Recognize that there is neither a single kind of intelligence nor a single instrument for measuring it.

4. Encourage parents, primary teachers, and others responsible for the supervision of children to note their abilities and interests early.

5. Observe the ability of children to solve problems and fashion products over an extended period as an indicator of interest and ability.

6. Use puzzles and games to help discover talent. Recognition of patterns and the ability to use other symbol systems are indications of intellectual ability.

7. Give thoughtful attention to particular groups such as minorities. When appropriate, avoid tests that rely on English vocabulary or comprehension. Supplement such tests with checklists of characteristics valued by the subcultures.

8. Use a wide range of testing strategies, including out-of-level testing.

9. Keep entrance requirements fairly modest and tentative, avoiding arbitrary cutoffs.

10. Avoid labeling any group of children as "the" gifted. To do so implies that some children are gifted in every area and others are gifted in none.

11. Provide a psychologically safe environment, in which individual abilities and strengths are valued and used.

Program

1. Recognize the importance of counselors in several capacities, including assessment, meeting affective needs, guiding program selection, and career and college choice counseling.

2. Build a comprehensive program, in which elements of the "mosaic" are added a little at a time.

3. Take care that programs are sequential, carefully integrated, and articulated throughout the educational system.

4. Offer program options that reach beyond the normal institutional boundaries, across disciplines, across grade levels, and across levels of intelligence.

5. Encourage independence through projects that culminate in real products and employ the methods of inquiry used by scholars.

6. Develop specific plans for concurrent enrollment at all levels.

7. Recognize that a few students will benefit from the opportunity to enter college early.

8. Make use of community resources, including the private sector, through mentorships.

9. Cooperate with local museums, arts organizations, and civic groups to increase the educational options available outside school walls.

10. Encourage students to participate in educational programs available on Saturdays and during the summers.

11. Consider specialized schools if the population of the community and the district's resources will support them.

12. Recognize that racing through the curriculum is not the primary goal of a gifted program. There must be a balance of acceleration and enrichment activities.

Staff Development and Teacher Support

1. Consider staff development as a continuous process for teachers, consultants, and administrators.

2. Develop teaching strategies that are appropriate to the learning styles of able students.

3. Arrange for joint planning among teachers at different levels with careful attention to the K-12 articulation of each content area.

4. Help teachers develop manageable record-keeping systems that allow them to monitor student progress without undue loss of instructional time.

5. Provide the regular classroom teacher with adequate support services so that enrichment can be available to able learners in the regular classroom.

6. Use nearby colleges or universities as a resource for ongoing staff development, for innovations in curriculum, and for educational research.

Evaluation

1. Plan the evaluation design as the program is being developed, so that baseline data may be established by which progress or change may be monitored and compared.

2. Conduct comprehensive and regular program evaluation to assure accountability. The evaluation must answer questions about the success of objectives-achievement and their impact on student growth and achievement.

3. Employ an external evaluator or team of evaluators to reinforce internal evaluation, assure objectivity, and lend credibility to the evaluation effort.

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